

IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

UNITED STATES OF AMERICA,)
)
Plaintiff,)
)
vs.) No. 10 CR 747-3
)
ANTONIO EVANS,) Chicago, Illinois
) August 21, 2012
Defendant.) 1:35 P.M.

TRANSCRIPT OF PROCEEDINGS - Daubert Hearing
BEFORE THE HONORABLE JOAN HUMPHREY LEFKOW

APPEARANCES:

For the Government: HON. GARY S. SHAPIRO
219 South Dearborn Street
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BY: MR. JASON A. YONAN

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1 (Proceedings had in open court.)

2 THE CLERK: 10 CR 747 dash 3, USA versus Antonio
3 Evans.

4 MR. YONAN: Good afternoon, your Honor. Jason Yonan
5 on behalf of the United States.

6 MR. BLEGEN: Good afternoon. Patrick Blegen and Dan
7 Rufo on behalf of Mr. Evans, who is present.

8 THE COURT: Good afternoon.

9 Mr. Evans, good afternoon.

10 All right. We are here for a Daubert hearing, right?

11 MR. YONAN: That's correct.

12 MR. BLEGEN: Yes.

13 THE COURT: So how do you wish to proceed?

14 MR. YONAN: The government would propose calling its
15 expert first and giving the defense an opportunity to cross
16 examine him, and then we'll go from there.

17 THE COURT: All right. Do you have your expert here
18 today or is it just the statement you gave me that I'm to rely
19 on, Mr. Blegen?

20 MR. BLEGEN: Oh, I'm sorry, yes. Our expert is
21 Manfred Schenk, who is standing up now.

22 THE COURT: Okay.

23 MR. BLEGEN: So we would propose to have him testify
24 after the government's witness. I think they have decided that
25 because they have the burden, which makes sense, and we have

1 discussed this, we were going to have the witnesses stay in
2 court for each other's testimony, as experts often do.

3 THE COURT: Right. Okay. Is there any need for
4 opening statements? I have read the materials.

5 MR. YONAN: I don't believe so, Judge.

6 MR. BLEGEN: No.

7 THE COURT: All right. Then let's get to work.

8 MR. YONAN: All right. Your Honor, the government
9 would call Joseph Raschke to the stand.

10 (Witness sworn.)

11 THE COURT: Good afternoon.

12 THE WITNESS: Good afternoon, your Honor.

13 JOSEPH RASCHKE, GOVERNMENT'S WITNESS, DULY SWORN

14 DIRECT EXAMINATION

15 BY MR. YONAN:

16 Q. Sir, could you please state and spell your name for the
17 record?

18 A. My name is Joseph Raschke, R-a-s-c-h-k-e.

19 Q. Where are you currently employed?

20 A. With the FBI here in Chicago.

21 Q. How long have you been employed with the FBI?

22 A. A little over 14 and a half years.

23 Q. What is your position at the FBI?

24 A. I'm a special agent.

25 Q. Do you work on a particular squad at the FBI?

1 A. I do. I'm assigned to our Violent Crimes Task Force.

2 Q. For how long have you worked on that squad?

3 A. For 12 years.

4 Q. And can you briefly describe for the Court what some of
5 your duties are in the Violent Crimes Task Force?

6 A. Sure. We investigate kidnappings, bank robberies,
7 fugitives, other violent crimes. And I also serve as the
8 principal relief supervisor for the task force.

9 Q. As part of your duties as an FBI agent, do you analyze cell
10 phones?

11 A. I do.

12 Q. How often --

13 A. I analyze cell phone records.

14 Q. How often do you analyze cell phone records?

15 A. I probably spend close to 70 percent of my time doing work
16 on cell phone records.

17 Q. For what purpose do you analyze cell phone records?

18 A. I do historical cell site analysis on the records. So the
19 purpose is to determine approximate locations where cell phones
20 were located at the times that the calls were placed that are
21 detailed in the records.

22 Q. You mentioned historical cell site records. What are
23 those?

24 A. Those are records that are kept by the phone company. And
25 what they are are details of incoming and outgoing calls, as

1 well as sometimes text messages and data transactions, meaning
2 emails checks.

3 And what they do is list the information about that
4 call to include time and date of the call, duration, the
5 numbers that are associated with the call, who is calling who,
6 and then cell site information to indicate which cell towers
7 were used. And some of the records will give you cell sites
8 just at the beginning of the call and some will give you cell
9 site records at the beginning and at the end of the call.

10 Q. As part of your duties analyzing historical cell site
11 records, did you receive -- have you received any specialized
12 training?

13 A. I have.

14 Q. And can you describe for the Court some of the training you
15 have received?

16 A. Some of the training I have received would include training
17 by the FBI in historical call detail record analysis, as well
18 as cell phone tracking. I received training from a private
19 entity that contracts with the government and with the military
20 in regard to cellular network structure and cell phone
21 tracking. I have received training from the major cell phone
22 companies in how their networks work, how their records are
23 populated, how to interpret their records. The training has
24 been focused on those issues primarily.

25 Q. I'm going to direct your attention to the binder in front

1 of you and an exhibit that's been marked as Government Exhibit
2 CV.

3 Do you have that in front of you, Agent Raschke?

4 A. I do.

5 Q. What is that document?

6 A. This is my CV. It details my professional experience,
7 education, training, and instruction. It is my experience
8 with -- as an FBI agent and in regards to cell phone analysis.

9 Q. Directing your attention to the bottom of the first page of
10 the section titled Professional Training and Instruction.

11 Do you see that?

12 A. I do.

13 Q. And you list there that you have received over 350 total
14 hours in the use of cellular phones and investigations,
15 cellular network set up, and cell phone protocols.

16 Can you describe a little bit about what that
17 training consisted of for the Court?

18 A. Sure. That's training in regard to the different
19 protocols. Different phone companies use different
20 technologies in terms of how they connect calls through their
21 network. So GSM and iDEN and CDMA, those are different
22 technologies that are used by the different companies, so an
23 understanding of how those technologies work.

24 There has been, you know, training in radio frequency
25 theory and propagation, things of that nature. So it is just

1 training in how cellular phones operate and then how the
2 networks handle the traffic associated with cellular activity.

3 Q. Have you specifically received training from the cellular
4 phone provider Sprint Nextel?

5 A. I have.

6 Q. Have you received training on how Sprint's network
7 operates?

8 A. I have.

9 Q. Have you had contact with engineers from Sprint?

10 A. I have. I'm in regular contact with network engineers
11 from, not just Sprint, but for all the other major cellular
12 providers.

13 Q. Why would you be in regular contact with the network
14 engineers?

15 A. Just to stay updated on how their networks are being
16 structured and planned and maintained. And then if I have any
17 questions about anything that I am seeing in the records, I
18 keep in touch with them just to make sure I'm understanding
19 what it is that they are doing.

20 Q. Now based on this training that you have received as part
21 of your duties as an FBI special agent, have you instructed
22 others on these techniques that you have learned?

23 A. Yes, I have.

24 Q. Who have you instructed on these cellular phone techniques
25 in which you have been trained on?

1 A. I teach classes to other federal -- other federal agents,
2 investigators, as well as state and local investigators,
3 detectives, to instruct them on what information is available
4 from call detail records, you know, how networks are set up,
5 how to understand what those records can tell you. And I have
6 done that here locally, and I have also traveled to provide
7 that training.

8 Q. Now the second page of Government Exhibit CV-1, titled
9 professional instruction, does that list some of the other
10 officers that you have instructed on these cellular phone
11 techniques?

12 A. Yes, it does.

13 Q. So it includes the Chicago Police Department, Cook County
14 State's Attorney's Office, among others?

15 A. Yes, among others.

16 Q. Have you been qualified as an expert in cell site location
17 analysis?

18 A. I have.

19 Q. How many times have you been qualified?

20 A. Five times.

21 Q. Where were you qualified?

22 A. In state court here in Cook County.

23 Q. When was the most recent time you were qualified?

24 A. Last week.

25 Q. And was that in the context of a jury trial?

1 A. Yes, it was.

2 Q. The other four occasions, was that also in the context of a
3 jury trial?

4 A. One was a bench trial, and the others were jury trials.

5 Q. Have you conducted formal cell site analysis for other law
6 enforcement agencies?

7 A. I have. I have conducted analysis for the Cook County
8 State's Attorney's Office, the United States Attorney's Office
9 here in the Northern District.

10 Q. Agent Raschke, based on your training and experience, can
11 you explain to the Court generally how a cell phone operates?

12 A. Generally speaking a cell phone is -- it is a radio
13 device. It communicates back and forth with the network that
14 it is associated with by radio frequencies. And it does that
15 through the cell towers that are set up by the cellular
16 networks in the area.

17 So cell phones, when you want to place a call, send
18 signals via radio frequency to the cell towers. The cell
19 towers then process that information through the network.

20 When the network wants to find the cell phone for an
21 incoming call, it finds that phone out there in the network by
22 determining which cell tower it is associated with, and pushes
23 that information to the cell phone.

24 So it is all done by radio frequency through the cell
25 towers, you know, between cell tower and cell phone.

1 Q. Is the cell tower sometimes referred to as a cell site?

2 A. It is. They are used interchangeably. Oftentimes I'll
3 refer to a cell tower as the entire structure, and a site as
4 perhaps a sector of that tower. But I'm sure I'll use them
5 interchangeably as well.

6 Q. And does a cell phone operate on a cell tower of any
7 provider or the specific provider it runs on that network of?

8 A. Right. That's -- as I mentioned earlier, there is
9 different technologies that the different phone companies use.
10 So my AT&T iPhone operates on what's called GSM technology. So
11 that's different technology than Sprint operates on.

12 So my AT&T phone communicates with the
13 closest -- with the AT&T tower that it is getting the best
14 signal from. So it doesn't -- you can't just look around and
15 see the tower that's closest to you and say, my phone is
16 communicating with that tower, it has to be the tower for your
17 service provider.

18 Q. What about the towers themselves, what do the towers
19 consist of?

20 A. Well, the towers consist of transmitters and receivers,
21 antennas, and they are -- some are constructed on tall, you
22 know, pole-like structures. Others are mounted to buildings or
23 water towers. Water towers is a popular one around here. And
24 so is the mounting of the antennas to structures.

25 But it is antennas on one of these structures that

1 are connected to a large computer network at the base of that
2 system by wires and cables.

3 Q. Are these antennas directional?

4 A. Some of them are directional. A lot of the towers in
5 Chicago are directional. So they will be sectorized.

6 A lot of the Chicago towers are divided into three
7 sectors. If you think of the coverage area of a cell tower in
8 a circle, and you divide that coverage area into three sectors,
9 if each sector covers 120 degrees of that circle.

10 There is also towers that are omni directional,
11 meaning that they broadcast their radio frequency out in all
12 directions. And we think of that as if you drop a pebble into
13 a pond and you see the ripples, you know, moving in all
14 directions, that would be an omni directional.

15 Some are two sided, you know, sectorized into two
16 sides. And then there is others that are six sided. So it
17 just depends on how the network wants to set them up. But
18 primarily in Chicago we see a lot of three-sector towers.

19 Q. And for what reason would there be a three-sector tower?

20 A. Well, the reason they sector towers off is to be able to
21 point and direct the energy, the radio frequency from the
22 tower, in the direction that they want to, and then to provide
23 that specific area of coverage with that dedicated amount of
24 radio frequency.

25 So, you know, they will set up the tower, determine

1 how they want to orient the sectors of that tower, and then
2 position their antennas in that direction. And then they
3 provide lists of their towers and how the tower sectors are
4 oriented when you request that from them.

5 Q. Have you used the term -- have you heard the term,
6 granulate, used in -- in your cell site location analysis?

7 A. I have.

8 Q. And what does that mean?

9 A. So to granulate basically means to narrow down, you know,
10 the possible area. So when you have a cell tower, if it is an
11 omni directional tower, what that means is that if a cell phone
12 uses that tower to place a call, what you can granulate down to
13 is the coverage area of that tower is where the phone would
14 be.

15 If the tower is sectored, and the phone uses an --
16 it -- the phone uses a sector of that tower, you can granulate
17 further. You can granulate down to this -- the coverage area
18 of that sector of the tower. So it is a means to narrow down
19 the possible area where the cell phone --

20 Q. Have you had discussions with network engineers about
21 granulating? Granulation.

22 A. I have.

23 Q. And have they ever told you that that's not possible?

24 A. No.

25 Q. Did you ever have -- and these networks that -- you have

1 contact with network engineers from Sprint?

2 A. Regularly.

3 Q. In your experience and training, have you personally
4 determined the location of a cell phone based on historical
5 cell tower data?

6 A. I have determined the approximate location of a cell phone
7 with historical cell site data on many occasions.

8 Q. And how did you do that?

9 A. So that would be obtaining the records. And again, as I
10 stated earlier, they will detail the information about the
11 call, the time and date of the call, and then what tower, and
12 often what side of the tower that call was placed on.

13 And then when you take a look at where that tower is
14 physically located, which is information you could obtain from
15 the tower list, that tells you where the -- what the tower is
16 specifically located by its latitude and longitude. And then
17 you determine from the list which direction that sector is
18 pointed in, and then you do other comparisons. You check to
19 see where the other towers in the area are and which way they
20 are projecting energy. You know, so the distance between two
21 towers. What the topography of the area is. Things that might
22 interfere with those radio frequencies. And then that allows
23 you to make -- to determine the approximated area of where that
24 phone would be, understanding that the phone has to be within
25 the coverage area of that sector because it is using that

1 sector.

2 Q. Do you have an understanding of how a phone chooses a tower
3 to use?

4 A. Yes.

5 Q. And can you explain to the Court what factors are based in
6 that analysis? What factors a phone would use.

7 A. Sure. So cell phones are designed, they are designed to
8 use the best signal that they are receiving, that they can
9 get. And the reason for that is because that ensures the best
10 possible call quality. So as a cell phone sits in an idle
11 state -- none of our phones because they are all turned off
12 right now. But when we leave here and turn our phone on, our
13 phone is going to start scanning the environment to determine
14 where it is getting its best signal from, its best signal
15 strength. And it is going to identify that signal as the one
16 it would use, you know, for -- to access the network to make a
17 call, to use network resources. And then it also monitors the
18 other signals in the area, and it keeps evaluating and
19 maintaining this list of what other signals it is receiving in
20 order to ensure the best call quality.

21 Q. And you found, based on your experience -- typically
22 speaking, where does a phone receive the best signal from?

23 A. It generally receives the best signal from the tower that
24 it's nearest. That's not always the case. But for the most
25 part it is.

1 There are factors that affect the signal that's
2 coming from a cell tower. And an example that I would use is
3 if you were downtown and you were standing in front of the
4 Willis Tower, the closest tower for your network may be behind
5 the Willis Tower from you, and you may not get a good enough
6 signal from that tower because you have got this gigantic
7 skyscraper in front of you. So it may be a tower that's
8 physically further away, but this is in a better line of sight,
9 meaning there is less interference for the radio frequency to
10 get to your phone. So that would be a time where you would
11 select a different phone.

12 So there is factors that are involved. The radio
13 frequencies, you know, they bounce off of things. They are not
14 static. And, you know, they bounce off and reflect -- refract
15 and redirect and things like that. But generally speaking, the
16 phone that you are closest to is going to give you the best
17 signal.

18 Q. What other factors would there be? You mentioned an
19 obstruction. Would there be other factors that might affect
20 which tower a phone uses?

21 A. Sure. There is -- you know, there is topographical
22 considerations. San Francisco is a very hilly area. We are
23 fortunate here in Chicago we don't have the -- when it comes to
24 this kind of analysis, we don't have all the hills and
25 valleys.

1 But, you know, if you are located down in a valley
2 and, you know, you may not be getting the strength -- the best
3 signal from a tower that isn't broadcasting down into that
4 valley, that may be a tower that's further away that actually
5 is.

6 And sometimes they set up in situations like the
7 umbrella towers which just broadcast a lot of energy over an
8 area like that to cover -- to cover those types of situations.

9 But -- so topography. But, you know, the big factors
10 are the relationship to the other towers in the area,
11 obstructions, and distance.

12 Q. What about the relationship to other towers in the area?
13 Can you explain that?

14 A. Sure. So if a cell tower -- you know, the networks they
15 set up their cell towers, you know they -- in Chicago, and they
16 space them apart. Well, as you move from, you know, proximity
17 to one tower towards the next closest tower, what happens is
18 now you're moving into that range where the radio frequency
19 coming off of that tower is going to be stronger. So those
20 towers send energy at each other in order to provide an area of
21 overlap. And you need that area of overlap so you don't have
22 dropped calls. So as you are walking through the coverage area
23 of one to the next your phone doesn't drop the call.

24 So as you get closer to the designated coverage area
25 of that next sector, you are then going to get your best signal

1 from that sector. And the network will move your phone traffic
2 to that tower.

3 Q. In an urban environment, such as the Chicago area, would a
4 cell -- well, first let me ask you more generally, do you have
5 an understanding of what factors affect the range of a
6 particular cell tower?

7 A. Sure. Let me -- there is several factors that affect the
8 range. The distance between its neighbor towers affects the
9 range. You know, distance affects the quality of radio
10 frequency signals.

11 The other thing is how the towers are oriented. You
12 know, the panels will be tilted. You know, they are not tilted
13 up into the sky where they are just broadcasting into nothing,
14 they are angled down towards the area that the network has
15 decided that they want covered.

16 So, you know, things that affect it are distance, you
17 know, competing radio frequency, orientation of the tower, the
18 tilt of the antennas.

19 Q. In an urban environment, such as the Chicago area, do cell
20 towers have greater or lesser range as compared to a rural
21 area?

22 A. They have less of a range. The urban areas are more
23 densely populated with cell towers because they are more
24 densely populated with individuals, and, you know, customers
25 and obstructions. And so in an area like Chicago, you're going

1 to have cell towers in the -- you know, downtown, in the
2 surrounding downtown area, that are very closely located to
3 each other. Whereas as you move out into the western suburbs
4 the towers are going to be -- they are going to be further
5 apart. And that's because you're going to have less population
6 in there that you need to have service for. You're going to
7 have less obstructions. The towers will be able to handle that
8 area, a greater area than downtown.

9 Q. Based on your experience if there are more cell towers in
10 an area, can you more closely approximate the location of a
11 phone?

12 A. Yes.

13 Q. And why is that?

14 A. Well, that's for many of the reasons that I just
15 described. When towers are closer to each other, they have
16 less area of responsibility. And as -- and, again, as I said,
17 when you get closer to the next tower, that's going to be the
18 better signal strength for you. And if those towers are closer
19 together, you are minimizing where that area could be.

20 Q. Now as part of your work in this case, did you prepare some
21 charts?

22 A. I did.

23 Q. And they are contained in the binder in front of you, is
24 that right?

25 A. That's correct.

1 Q. First, generally, how did you prepare those charts?

2 A. These charts are prepared using a mapping software. And so
3 what I do is I take a mapping software, and I import tower data
4 into that software. So the cell phone company provides me a
5 list of where all their towers are by their latitude and
6 longitude. I can import those latitudes and longitudes into
7 the software.

8 So I import the towers in there, and then I go
9 through the call detail records, identify which towers are
10 being indicated in the records, and then find them on the map
11 and indicate where those cell towers are actually located in
12 reference to those calls.

13 Q. And in this particular case you compared those in the
14 charts with fixed locations relevant to this case?

15 A. That's correct.

16 Q. I'm going to start by asking you to take a look at what's
17 been marked as Government Exhibit Summary 1, which should be in
18 front of you.

19 A. Okay.

20 Q. What was reflected in Government Exhibit Summary 1?

21 A. So this exhibit, again, it is a look at the map, number
22 one, that I made. And what you see on the map is you'll see
23 some red triangles on that map. Those are where Nextel cell
24 towers were located back in April of 2010.

25 And then I have up in the upper left corner the phone

1 number that I was analyzing, which is (773)447-4481.

2 Q. And let me just ask you -- stop you for a second. That
3 phone number, did you look at subscriber records for Sprint
4 Nextel concerning that phone number?

5 A. I did.

6 Q. And let me just ask you to take a step back. Are you
7 familiar with what a subscriber record is?

8 A. I am.

9 Q. And what is a subscriber record?

10 A. A subscriber record is a record maintained by the phone
11 company of who is listed as the account holder on that cell
12 phone.

13 Q. And did you refer to subscriber records for this phone,
14 (773)447-4481?

15 A. Yes.

16 Q. And who did you determine was listed as a subscriber for
17 this phone?

18 A. Antonio Evans.

19 Q. So turning your direction -- and was there an address
20 listed on the subscriber records?

21 A. There was.

22 Q. And do you remember the town where the address was located?

23 A. In Maywood.

24 Q. So directing your attention back to Summary Chart 1, what
25 is it that you performed for this chart?

1 A. So this chart displays the -- it is a geographical
2 depiction of the call that was placed in the records for this
3 phone on 4-23-2010 at 7:54 A.M.

4 So what's indicated is there is a call out box that's
5 pointing to one of the red triangles there, and it is labeled
6 2815 46773. In the records for the phone call that was made at
7 that time on that date, the cell phone utilized that tower
8 that's indicated by that call out box. So that's the location
9 of the tower.

10 THE COURT: That's the little red spot?

11 THE WITNESS: Correct, the little red triangle.

12 BY MR. YONAN:

13 Q. It is the location of the tower used for that phone call?

14 A. That's correct.

15 Q. Is that -- were you able to determine if that's the closest
16 tower to this location you have listed on -- in Cicero,
17 Illinois?

18 A. It is the closest Nextel tower to that location that I
19 listed in Cicero there.

20 Q. And do you -- were you able to approximate the distance
21 between that location and the cell tower?

22 A. It is a little over four tenths. So it is .46 miles. Less
23 than a half a mile.

24 Q. I'd like to have you take a look next at Government Exhibit
25 Summary 2.

1 THE COURT: Excuse me.

2 MR. YONAN: Sure. Go ahead.

3 THE COURT: Would you repeat your last question, what
4 you were asking him after .46 miles?

5 BY MR. YONAN:

6 Q. Were you able to approximate the distance between the
7 location on Cicero -- in Cicero, Illinois, and the cell tower?

8 A. Yes, the distance between where that cell tower is
9 physically located and that address in Cicero is .46 miles
10 approximately.

11 Q. And that was the cell tower used for that call?

12 A. Yes.

13 Q. And do you have an understand- -- why would you pick that
14 location here in Cicero, Illinois?

15 A. This was the relevant location that I was given for the
16 analysis.

17 Q. It is your understanding that's the location -- the
18 approximate location of the kidnapping in this case?

19 A. Yes.

20 Q. Directing your attention next to Government Exhibit Summary
21 2.

22 A. Yes.

23 Q. Can you explain to the Court what's reflected in 2?

24 A. This is a geographical depiction of the phone call that was
25 placed that started at 7:55 A.M. and ended at 7:56 A.M. And

1 the records indicate that the call initiated on the same tower
2 we just finished talking about, and terminated at the tower
3 that you see in the upper right there marked 2815 2015.

4 Q. And so I'm clear, this is a separate call than the one we
5 looked at in Government Exhibit Summary 1?

6 A. Correct. This is the call after the call in Exhibit 1.

7 Q. And could you repeat, it started on one tower and ended on
8 another?

9 A. Correct.

10 Q. Which tower did it start on?

11 A. It started on 46773.

12 Q. And which tower did it end on?

13 A. On the 2015 tower, the one to the right, to the west -- or
14 the east. I'm sorry.

15 Q. And have you seen instances such as this where multiple
16 towers were used during a call?

17 A. Yes.

18 Q. And in what circumstances have you seen that?

19 A. Well, there is a couple circumstances. If you are moving,
20 your call will hand off to the next -- to the tower that is --
21 that you are moving closer to, that you are getting -- or that
22 you are getting a better signal from. That's one option.

23 Another thing that happens is a cell phone -- again,
24 a cell phone decides which tower it is going to initiate the
25 call with. So if a cell phone says, all right, I have got

1 traffic I want to send through the network, the tower can
2 capture that. And the network can make a decision and say,
3 this tower is getting busy, I'm going to move it to another
4 tower to actually handle the traffic.

5 The call gets populated with the tower -- the call
6 detail records get populated with the tower the phone selects.
7 But the network can then move that traffic to another
8 location. So that's another thing that happens. And
9 oftentimes on short duration calls we'll see that. When you
10 have got longer duration and some space between the towers, it
11 is also indicative of movement by the phone.

12 Q. And I think you have mentioned the numbers on the -- that
13 reflect the towers. What do those numbers mean?

14 A. So where I have 2815 46773, on that tower that's in the
15 upper left, that is the identification number for that specific
16 tower and sector that Nextel has designated for that. Each
17 tower has its own unique identifying number. And that's how
18 you can distinguish that tower from any other tower. And there
19 are I don't know how many thousands of towers out there. But
20 it is called a global cell ID. It means there is only one
21 tower in that area.

22 The 2815 refers to a group of towers. So 2815 will
23 have several towers in that grouping. But 46773 is that sector
24 of that tower within 2815. And that's listed in the cell site
25 -- in the tower listing that you get from the phone company,

1 that's listed in the call detail records so you can match them
2 directly.

3 Q. The second tower that the call terminated on, which would
4 have been tower 2815 2015, is that correct?

5 A. Yes.

6 Q. Is that the second closest tower to the location of the
7 kidnapping?

8 A. I believe it is. I didn't mark the distance on that one,
9 but, yes, I think it is less than a mile.

10 Q. I'm going to direct your attention next to Government
11 Exhibit Summary 3.

12 What is reflected in that summary chart, Agent
13 Raschke?

14 A. This is the same map that we have been looking at, but from
15 a view farther away. And what's reflected here is, I have
16 noted where that tower 2815 46773 is located, as well as the
17 address in Cicero. And then this gives a picture for the
18 location of Nextel towers in the area.

19 Q. So each one of the red triangles indicates a Sprint Nextel
20 tower over basically the course of Chicago and part of the
21 western suburbs?

22 A. Correct. And as you could see in the downtown area, they
23 are much more clustered together. And as you get further away,
24 they will get spread apart a little bit further.

25 Q. Please take a look at the next exhibit, Government Exhibit

1 Summary 4.

2 What's depicted on Government Exhibit Summary 4?

3 A. This is again the same map. But now included on the map is
4 the subscriber address for the phone number that we're
5 discussing. So the subscriber address of 1114 Madison Street
6 in Maywood is indicated on the map, along with the tower and
7 that address in Cicero.

8 Q. And the red towers again indicate the location of -- red
9 triangles indicate the location of towers in that area?

10 A. Yes.

11 Q. And there appear to be red triangles at or around that
12 location on Madison Street in Maywood, Illinois?

13 A. Yes.

14 Q. If you could take a look next, Agent Raschke, at summary --
15 Government Exhibit Summary 5 and explain what's depicted in
16 that exhibit.

17 A. What's depicted here, again, it is the same map. Now this
18 is a view further to the east. And what's depicted here is the
19 address in Cicero and the tower that was utilized, according to
20 the records, by the phone at 9:09 A.M. on April 23rd.

21 And so that tower is indicated there in just about
22 the center of the map as 2828 dash 28576. That was the tower
23 that was utilized for a call at 9:09 A.M.

24 And then down at the bottom right of the map, I have
25 indicated another address that was provided as relevant to the

1 investigation, 5749 South Seeley Avenue in Chicago.

2 Q. And based on this chart it appears that the phone was using
3 a tower to the southeast of the previous tower that it used?

4 A. Correct.

5 Q. I'm going to refer you next to Government Exhibit Summary

6 6. But before I ask you specific questions about what's
7 reflected in that exhibit, I'm going to ask you first, are you
8 able to estimate coverage ranges around particular cell towers?

9 A. Yes.

10 Q. And can you explain to the Court how it is that you do
11 that?

12 A. Sure. It is -- again, it is taking into account all the
13 factors that I have previously discussed. So with the
14 understanding of how the networks are set up and how these
15 radio frequencies operate and an understanding that the Nextel
16 network is designed to provide full coverage for this area, I
17 look at the orientation, you know, which tower is used. If
18 there is a sector, then which sector was used. The orientation
19 of that sector, meaning which direction it points in.
20 Understand that that sector is -- if it is a three-sided tower
21 -- is responsible for 120 degrees of that circle.

22 And then based on the other considerations, meaning
23 the distance to the next closest towers, the topography,
24 obstructions, and things like that, you can estimate the
25 approximate area that is covered by that cell site sector.

1 Q. Why does the distance to the next closest tower affect that
2 analysis?

3 A. It affects it because, again, as you get closer to that
4 tower, that tower's radio frequency is going to become stronger
5 and more attractive to the phone.

6 Q. In your experience have you seen instances where a phone
7 consistently hits off two towers in the same area?

8 A. Yes.

9 Q. And are you able to determine why that is?

10 A. Sure. When over the course of a period of time a phone is
11 hitting off two different towers sectors, or it can be the two
12 sectors of the same tower, what that indicates is that that
13 phone is located in an area where both of those sectors are of
14 almost equal attractiveness to the phone. It is getting that
15 signal that's deeming to be the best from both of those. And
16 where you'll see that is where those sectors overlap. And
17 again that overlap is designed to prevent call failures, to
18 prevent gaps in coverage by the network.

19 Q. All right. Now, Agent Raschke, take a look at Government
20 Exhibit Summary 6. I'm going to ask you what is depicted on
21 that summary chart.

22 A. What's depicted here is the call activity for a period of
23 time on the 24th of April, 2010. So from 12:54 P.M. to 1:12
24 P.M., an 18-minute period.

25 And during that period the call detail records for

1 the 4481 phone number indicate that in that 18 minutes the two
2 sectors that are indicated, the sector 566 1460 and 2828 46270,
3 were utilized nine times during that time period for either,
4 you know, beginning cell site, ending cell site, you know, or
5 beginning or ending cell site.

6 So that -- those are the two cell sites that were
7 utilized nine times during that 18-minute period. The
8 approximated coverage area for those sectors is indicated in
9 the red-shaded area, as well as the Seeley address that we
10 discussed before.

11 And then I have also indicated on here the location
12 of a Cricket phone company cell tower. That was the tower that
13 was utilized for a call on a different phone number, from a
14 different phone number, at 12:59, so during this time range
15 also.

16 Q. Your understanding is that that Cricket phone number is
17 also -- that phone call on the Cricket phone number was also
18 relevant to the case?

19 A. Yes.

20 Q. And I know you mentioned this generally, but actually
21 specific to this chart, how did you come up with the shaded
22 areas which reflect the estimated coverage range?

23 A. So -- several ways. First of all, again, looking at them
24 on the map to determine where they are located. Determining
25 their proximity to the next closest cell towers and the sectors

1 on those towers. Determining how those sectors are oriented,
2 meaning which way they are protecting their energy. And then
3 actually going out and looking at the towers to confirm that
4 they are oriented.

5 Well, number one, that they are where they are
6 supposed to be, that they are oriented in the way that they are
7 supposed to be, and then looking at topography and the area to,
8 you know, identify things that would be -- you know, that would
9 obstruct that signal.

10 Q. Based on what you have estimated the coverage ranges to be,
11 where does that address on Seeley Avenue lie?

12 A. That falls in my estimated overlap area for the coverage of
13 the two sectors.

14 Q. If you could next take a look at Government Exhibits -- and
15 I'll have you just go through them in sequence -- Summary 7 and
16 Summary 8, and explain to the Court what those charts are.

17 A. Sure. So I'll start with Number 7. And what this exhibit
18 is is this is just, as I said, it is one of the things that I
19 do when I am actually looking at the environment to try to
20 determine what the coverage areas are going to be. But what
21 this is is on a program Google Earth Pro program.

22 I have indicated the address on Seeley. And then to
23 the right is the latitude and longitude for where the cell
24 tower 2828 46270 is indicated. So you can mark these points,
25 and then get a topographical view. So you can check the

1 elevation -- you know, what elevation changes might be in there
2 that might affect the performance of the radio frequencies.

3 And then the diagram of that elevation is seen below.

4 And I do the same thing for the other tower, the 566
5 1460, and that's on Exhibit 8. And then what it shows is,
6 again -- and this, you know, it is not uncommon here in
7 Chicago, but a very, you know, flat, you know, not hilly area,
8 so you're not going to have that kind of interference. But it
9 is just another way to, you know, ensure that you are looking
10 at accurate information.

11 Q. Have you actually gone to those two towers and examined
12 them?

13 A. I have gone to both these towers. And I went to the towers
14 in the first couple exhibits that we have seen. And, again,
15 that's to confirm, number one, that they are where they are
16 supposed to be and how they are oriented.

17 Q. And what do you mean by how they are oriented?

18 A. So the phone companies when they set up a tower and they --
19 they decide which way they are going to direct that tower's
20 energy. They use north as zero. So if you think 360 degrees,
21 zero is north.

22 And then what they will tell you is, as an example,
23 if this Section 1 points at 90 degrees, it means that the
24 center of that side of the tower points, you know, straight
25 east or 3:00 o'clock on a clock base. And then the energy is

1 radiated out in 120 degrees, 60 degrees on each side, to cover
2 that sector area. So it is a way to -- so when you go to the
3 tower and you determine where north is, then you can then
4 evaluate and determine which way the sectors are oriented.

5 Q. And take a look next at Government Exhibit Summary 9.

6 A. Okay.

7 Q. What's depicted on Government Exhibit Summary 9?

8 A. What this is is it is an analysis of the call detail
9 records. So for an approximate 36-hour time period, from 7:54
10 A.M on the 23rd of April 2010, until 7:30 P.M. on the 24th of
11 April 2010, I sorted the records to determine which cell sites
12 were being utilized by the phone.

13 And then, you know, second -- divided those by
14 whether it was an originating, meaning that it was that cell
15 tower that started the call or that cell tower at the end of
16 the call. And so what I have done is, you know, ranked them in
17 order of how many times they were used. And what's indicated
18 in the red-shaded area is that for this time period the -- one
19 of those two cell towers that we were just discussing, the 1460
20 and 46270, was the cell phone used when the call originated 191
21 times or 74 percent of the call. It was used as the
22 terminating cell site in one of those two towers 210 times or
23 81 percent of the time.

24 Q. Directing your attention back to, I believe it was the
25 first summary chart, which hit off of a tower in Cicero, how

1 many times did you see this phone (774)337-3381 use that tower,
2 that Cicero tower?

3 A. So during this period that phone utilized that tower, which
4 is 2815 46773, two times as the originating and one time as the
5 terminating. And those are the calls that we detailed in the
6 earlier exhibits.

7 Q. And during this time period didn't use those -- that --
8 those two towers any other times?

9 A. Correct.

10 Q. Now, Agent Raschke, these techniques that you have
11 testified about, both generally and specific to this case, do
12 you use those techniques every day when analyzing cell phone
13 records?

14 A. Yes.

15 Q. Have you used those techniques to locate individuals in
16 various types of cases, like kidnappings or fugitive
17 investigations?

18 A. Many times.

19 Q. Approximately how many times have you used these techniques
20 to actually find someone, whether it be a kidnapping case or a
21 fugitive case?

22 A. I don't know how many dozens of times it would be. And
23 that's just myself personally. That doesn't include the likely
24 thousands of times that other FBI agents and law enforcement
25 officials have done it.

1 Q. Would it be fair to say that as part of your duties you
2 have reviewed thousands of call detail records?

3 A. That would be more than fair.

4 Q. And would it is also be fair to say that many, if not most
5 of them, refer to call detail records in the Chicago area?

6 A. Yes.

7 Q. In your analysis of those records, what's the farthest away
8 you have seen a cell phone hit off of a tower?

9 A. I saw on one occasion where a tower that was six miles away
10 was utilized and was able to determine, after seeing that and
11 discussing that -- it was a Cricket tower -- and discussing
12 with their engineers, what we were able to determine was that
13 tower is located out on Navy Pier. And the phone that was
14 utilizing it was on Lake Shore Drive. So it was coming up Lake
15 Shore Drive and had basically a direct line of sight to that
16 tower. The radio frequencies were coming out. There was no
17 obstruction. It was going over -- over the water, and it was
18 able to do that. That was the furtherest I have seen. It
19 happened one time.

20 And all the other call activity around that was to
21 the much closer towers to the vicinity where that phone was
22 traveling.

23 Q. What is the typical distance you have seen phones use
24 towers for when you review records?

25 A. Here in the Chicago area it is typically one to two miles.

1 And when you're in the heart of downtown, it is less than that.

2 Q. Now I have asked you specifically about your use of these
3 techniques, but let me ask you more generally, are you aware
4 that other FBI agents on your squad used the techniques that
5 you have just described?

6 A. Yes.

7 Q. And are you also aware that FBI agents across the country
8 use these techniques that you have just described?

9 A. Yes, every day.

10 Q. Are you aware of FBI agents using these techniques with
11 success to locate individuals in cases such as kidnappings or
12 fugitive investigations?

13 A. Absolutely.

14 Q. Can you approximate how many times you know that these
15 techniques have been used successfully?

16 A. I would estimate it is in the thousands.

17 Q. Are you aware of any instances either for yourself or with
18 any agents you work with where these techniques have failed or
19 been inaccurate?

20 A. No.

21 Q. Because these techniques have been successfully used by the
22 FBI, do you teach them to other law enforcement agencies?

23 A. Yes.

24 Q. And for what reason do you teach these techniques?

25 A. The reason is because they work, and they are valuable

1 investigative techniques.

2 Q. Are you aware, Agent Raschke, of any case in which an FBI
3 agent was not allowed to testify to the methodology that you
4 have described here today?

5 A. No.

6 Q. The techniques you have testified here today, are they
7 consistent with the training you have received from cellular
8 phone operators?

9 A. Absolutely.

10 Q. Are they consistent with the training you have received
11 from cellular phone engineers at Sprint?

12 A. Yes.

13 Q. Have you had conversations with cell phone operators about
14 the methodology that you have talked about here today?

15 A. Yes, and their engineers as well.

16 Q. Do they agree with your methodology that you have used here
17 today?

18 A. Yes.

19 Q. Have they ever told you that it is impossible to locate the
20 approximate location of a phone based on these techniques?

21 A. No, they have not.

22 Q. To your knowledge and based on your training and
23 experience, do cell phone companies need to know the
24 approximate locations of their customers?

25 A. Yes, they do.

1 Q. And for what reason would that be?

2 A. Well, there are several reasons. They need to know where
3 their customers are so that they can ensure that they have got
4 the proper amount of service to that area. They need to know
5 what the usage is on their towers for planning purposes, for
6 determining whether or not they need, you know, more towers or
7 fewer towers. And they also have to be able to know where
8 these phones are in the event of an emergency.

9 MR. YONAN: Your Honor, if I may have a moment.

10 THE COURT: Yes.

11 (Brief interruption.)

12 MR. YONAN: I have no further questions, your Honor.
13 Thank you.

14 THE COURT: All right. Let's take a ten-minute
15 recess.

16 (Brief recess.)

17 CROSS EXAMINATION

18 BY MR. BLEGEN:

19 Q. Good afternoon, Agent Raschke.

20 A. Good afternoon.

21 Q. Your CV is admitted into evidence for this proceeding. I
22 just want to ask you a couple of questions about it. You
23 didn't leave anything out of there that is relevant, correct?

24 A. No, I don't think I left anything out of there that's
25 relevant.

1 Q. I don't want to waste a lot of time, but you're not an
2 electrical engineer, correct?

3 A. Correct.

4 Q. You never worked for a cell phone company, correct?

5 A. Correct.

6 Q. You were not involved in the establishing of any of these
7 cellular networks, correct?

8 A. Right.

9 Q. You have a degree in accounting, correct?

10 A. I do.

11 Q. Not mathematics.

12 A. Not mathematics.

13 Q. And not any engineering.

14 A. Correct.

15 Q. And you're not accredited as part of any engineering,
16 mathematic or scientific groups, correct?

17 A. Correct.

18 Q. Okay. Did you tell us just at the end of your testimony
19 that the FBI has a zero percent failure rate in using
20 historical cell site data to find a cell phone?

21 A. What I said is I'm not aware of any time that they went
22 based on this information to find the phone and found anything
23 to the contrary, that they didn't -- that they were not
24 successful.

25 Q. What do you mean found anything to the contrary?

1 A. Meaning that they found that the records were inaccurate or
2 that any issue, other than -- to indicate that the information
3 wasn't reliable. I'm not aware of any.

4 Q. But you are talking about information that is old, right?

5 A. What is your definition of old?

6 Q. Well, it is called historical cell site data, correct?

7 A. At the moment a call ends, it becomes historical.

8 Q. Okay. And in this case you're talking about two-year-old
9 cell site data, correct?

10 A. Yes.

11 Q. Okay. So the points that you are trying to pin down are
12 from two years ago, correct?

13 A. Yes. This call activity was two years ago.

14 Q. All right. And one of the things I think you told us that
15 you did was you drove around to look at the towers and to look
16 to see where the antennas were pointing, et cetera, correct?

17 A. Correct.

18 Q. Because that could have a dramatic impact on where you
19 think the cell phone might have been, right?

20 A. How the towers are oriented?

21 Q. Sure.

22 A. Yes.

23 Q. And how the antennas are oriented, right?

24 A. Correct.

25 Q. Do you remember you told us up and down could orient it,

1 right?

2 A. The tilt.

3 Q. Yes. And the angle, left or right, could orient it,
4 correct?

5 A. Correct.

6 Q. As to whether a tower had three antennas or no antennas,
7 right?

8 A. No antennas?

9 Q. Well, one antenna. I'm sorry.

10 A. Okay.

11 Q. That can be a difference, right?

12 A. Sure.

13 Q. But this was all two years ago, correct?

14 A. Correct.

15 Q. You didn't do your examination two years ago, did you?

16 A. I did not.

17 Q. You didn't examine records from Sprint as to how their
18 antennas were oriented two years ago, did you?

19 A. Their tower orientations were provided to me, and I was
20 told there had been no change in those tower orientations.

21 Q. Who told you there had been no change?

22 A. Nextel, Sprint Nextel.

23 Ericsson now.

24 Q. What's the name of the person?

25 A. I don't recall the name of the person who told me that.

1 Q. Well, part of what you have been relying on as you testify
2 here is engineers from Sprint or Nextel, right?

3 A. I don't understand your question.

4 Q. Let me ask it again. Towards the end of your testimony,
5 you said no one from Sprint or Nextel has ever told me that
6 this granulization procedure doesn't work the way I think it
7 does. Remember that?

8 A. That's correct.

9 Q. And you said that, right?

10 A. I did.

11 Q. And people told you in fact that it does work the way you
12 think it does, right?

13 A. Right.

14 Q. Electrical engineers, correct?

15 Or network engineers?

16 A. Network engineers.

17 Q. What are their names?

18 A. The network engineer that I dealt with at Sprint, I don't
19 know if I will be able to come up with his name right now.

20 Q. Okay. But there is a person?

21 A. Oh, yeah.

22 Q. And he told you that the longest distance that a cell phone
23 has ever connected to a tower on record is six miles?

24 A. I didn't say that. I said that the longest on that I have
25 in the records that I have dealt with.

1 Q. I see. Did he tell you you could do this method of
2 overlapping sectors and say this spot in the middle is where
3 the cell phone must have been?

4 A. I have been told by engineers from multiple phone companies
5 that when you see an area like that, where you see a phone
6 located between two areas like that, that that area of overlap,
7 that that's what that indicates. That's when it is bouncing
8 off two towers consistently over that time period, that that's
9 a good indicator that the phone is located in the overlap
10 area.

11 Q. All right. And they said bouncing off those towers
12 consistently, right?

13 A. Right.

14 Q. And they said it is a good indication, correct?

15 A. Correct.

16 I have also found that to be true in my own
17 experience in fugitive cases where we have seen those records
18 and then seen the address where we ended up making an arrest be
19 in that overlap area. I have seen it in practical experience
20 as well.

21 Q. All right.

22 A. This isn't just from discussions, it is just from my actual
23 work.

24 Q. I'm going to get to that in a minute. Okay?

25 A. All right.

1 Q. What are the names of the engineers who told you that this
2 overlap method worked, if you know, as you sit here now?

3 A. I don't know the names of all the engineers.

4 Q. Can you get that to us at some other date?

5 A. I don't know. I don't have the written records of phone
6 calls that I have made, so I can't tell you the time and date
7 and who I spoke to each time.

8 Q. All right. But can you -- I don't need the time and date.
9 Do you know the names of the people?

10 A. I don't as I sit here.

11 Q. All right. Would you be able to get that information when
12 you get back to your office?

13 A. I don't -- I don't think so. I don't know.

14 Q. Do you take notes when you communicate with these people?

15 A. Not all the time.

16 Q. Sometimes you do?

17 A. I'm not saying I have never done it, but usually when I
18 have a conversation with them, it is over the phone, it is a
19 discussion.

20 Q. Right. And you can take notes when you are on the phone,
21 right?

22 A. Of course.

23 Q. And do you have the names, do you think, of any of these
24 people back in the office?

25 A. I don't think I do.

1 Q. Do you write any reports of your discussions with these
2 people, like an FBI 302?

3 A. No.

4 Q. All right. When these people told you -- excuse me.

5 When these cellular network engineers told you that
6 this overlap idea of yours works, they said if the phone calls
7 are consistently on those two towers, right?

8 A. Correct.

9 Q. Did they tell you to ignore the fact that the cell phone at
10 the same time was on a tower far away?

11 A. Are you citing a specific example?

12 Q. I'm asking you if they ever told you that, ever.

13 A. Not told me to ignore anything, no.

14 Q. All right. But in Summary 6 -- can you turn to Summary 6
15 in your book?

16 A. Sure.

17 Q. Let me know when you are there.

18 A. I'm there.

19 Q. This summary -- tell me if I have got the idea here right.
20 You're trying to suggest that the cell phone that you have
21 attributed to Mr. Evans hit off the two towers 556 1460 and
22 2824 6270 near the same time, correct?

23 A. Correct.

24 Q. And that time, the time period between 12:45 and 1:12, is
25 important to you for the investigation purposes because that's

1 the -- around the same time that a Cricket phone called the
2 victim's father and the victim was allowed to speak to his
3 father. Right?

4 A. I don't know the specifics of that call. That sounds
5 right. But, yes, it was in that time.

6 Q. All right. Well, somebody told you that that time frame
7 was important, right? And so you listed nine calls during this
8 time period, correct?

9 A. Correct.

10 Q. There is actually 11 calls by the 4481 cell phone during
11 that time period, right?

12 A. Right.

13 Q. And in two of the calls, the phone hits off a tower almost
14 five miles away from there, right?

15 A. That's not.

16 Q. That's not?

17 A. No.

18 Q. Okay.

19 A. I could explain why you probably think that that is, but it
20 is not right.

21 Q. Okay. Tell us why we are wrong about that.

22 A. Sure. The tower that you are referring to -- I don't have
23 the records in front of me, but I think it is -- well, I don't
24 even remember the number of it. But in the records what you
25 will see is on that tower list, as you look at the name of the

1 tower, you'll see that there is a V in that name.

2 Q. Okay.

3 A. That V indicates that that site is a distributed antenna
4 site.

5 A distributed antenna site.

6 Q. You better tell us what that means.

7 A. Sure.

8 Q. You have not discussed that previously.

9 A. I have not.

10 Q. Okay.

11 A. So what the distributed antenna site is, and this is
12 something that Nextel does, is when they want to add -- when
13 they want to add a little bit more coverage, they put in these
14 very small omni directional antennas. And what they do is
15 rather than construct an entire site, an entire cell tower,
16 they connect those antennas to an existing site through fiber
17 optics.

18 On my 2010 tower list, that site with the V, the only
19 information you get is that it is connected to that tower list
20 that you are talking about over by Midway Airport.

21 The current list that I have from Nextel lists
22 exactly where that antenna is. Because that list is from 2012,
23 I did not include that on here. That tower is actually located
24 right near this residence. That little antenna is located
25 right near this residence on Seeley. Now --

1 Q. I'm sorry. That's where it is at now?

2 A. That's where it is now and where I believe it was at that
3 point. But what I don't have is something from 2009 to confirm
4 that.

5 So my list from 2009, my tower list clearly
6 indicates, you have a distribute antenna site here. So because
7 I can't verify on a document that's dated 2010, I didn't
8 include it on here.

9 Q. So --

10 A. So that -- that tower is located over by Midway Airport, I
11 don't know how -- if that's five miles away, okay. But I don't
12 believe that that is where that antenna is. I believe that
13 antenna is located right near 55th and Oakley. And, you know,
14 I'm waiting to get something from 2010 to actually indicate
15 that.

16 Q. All right. So that's where you think it is now.

17 A. And that's where I think it was then.

18 Q. All right. Well, I think -- what -- but you don't have any
19 records showing that is where it was then.

20 A. I do not. I have requested that.

21 Q. Currently it says -- it has got the Midway tower on there.

22 A. Correct.

23 Q. Which is down by Midway Airport.

24 A. Correct.

25 Q. Which is not really anywhere close to the overlap section

1 that you have got on this map.

2 A. Absolutely right.

3 Q. Okay.

4 THE COURT: Excuse me here a second.

5 So could you tell me again how that distributive --
6 whatever you said is -- how does that help and how does it
7 connect Midway Airport to --

8 THE WITNESS: Right. Basically what it is it is an
9 antenna -- it is a distributed antenna, meaning it is an
10 antenna that is tied to another site, meaning that's where it
11 is going to be, the site is going to be. So -- but it is
12 located in -- in another site.

13 So it is connected, you know, by cable to this
14 antenna, but it is not at the latitude and longitude where that
15 is. And they will do that to -- you know, if they -- if they
16 get an increase in customer needs or they get reports of this
17 area we're having dropped calls in this area, they will put a
18 smaller antenna in there, an omni directional one, to sort of
19 fill that small gap.

20 And then it is not a full, you know, rising tower or
21 panel system like you would normally see. And they call it a
22 distributed antenna site. And I have seen them multiple times
23 for Nextel. It is something that they do in the Chicago area.
24 Nextel is not -- they are not putting up more towers. In fact
25 they are beginning to tear down their network. Nextel is going

1 away. So this is a cheaper way to fill in those areas where
2 they need more service, than to actually construct a tower.

3 BY MR. BLEGEN:

4 Q. And they run a cable from Midway Airport to --

5 A. However the fiber optics are done, that's the explanation I
6 was given. They are connected by fiber optic cable to the
7 designated site that they have it tied to.

8 Q. Who gave you that explanation?

9 A. That was an explanation from Sprint. And I don't have the
10 name of who it was.

11 Q. Anywhere?

12 A. No.

13 Q. And that's signified by a V, correct?

14 A. If I had the records in front of me, I could point out
15 exactly what I am talking about.

16 Well, maybe I do actually.

17 Q. Okay. Here let me show you what I am looking at.

18 A. I'll look at Government Exhibit 9.

19 All right. So that tower 566 5508, you see that --
20 if you look at the chart I did on the left, the third one down,
21 that -- it starts NIL 3997 V. That V indicates a distributed
22 antenna site.

23 Q. Do you know what the V stands for?

24 A. I don't.

25 Q. All right.

1 A. So the --

2 Q. Yeah.

3 A. That tells me there are other locations that report to this
4 site. There are other antenna locations that report to this
5 site.

6 Q. How many?

7 A. That I don't know. I'm waiting to get the actual -- I want
8 to get something from 2010 that explains where all of them
9 are.

10 Q. So --

11 A. I have worked other -- I have worked other cases where I
12 saw one of these, and they had four distributed antenna sites,
13 all within about a mile and a half area, and I couldn't
14 delineate down between which one was being utilized by the
15 phone. I just wasn't able to do it.

16 But this one I don't know what the information is
17 yet.

18 Q. All right. When you said that the -- what do you call
19 these smaller antennas, the ones that are moved around?

20 A. The distributed antennas.

21 Q. The distributed antennas are within a mile and a half of
22 each other in your past experience or a mile and a half of the
23 cell tower?

24 A. No, not of -- of each other. That's one example that I
25 have seen. I don't know how the layout of this tower is. And

1 I'm sure it is different with each distributed antenna site
2 that they do. I'm telling you I have seen in the past where
3 they have distributed them and then been able to then verify
4 where those were at. But on this one I don't have that
5 information yet.

6 So I did not include that. I know from working with
7 these Nextel records and from my discussions with Sprint
8 Nextel, that when there is a V there, there is a distributed
9 antenna site there, and so first investigation has to be done.

10 So on my 2012 Nextel list, I can look it up exactly
11 by that number and find out where that site is. I could not do
12 that on my 2010 list, so it is not included.

13 Q. But you can -- strike that.

14 You also cannot go back and look at exactly where the
15 antennas on the stationary towers are angled from three years
16 ago, correct?

17 A. I cannot go back in time.

18 Q. So you're looking, when you draw these little shaded areas,
19 you're looking at 2012 or whenever it is you went out to look
20 at the stuff, that data, correct?

21 A. Correct. I have -- you're correct, I am looking at call
22 detail records from 2010. But you can -- you can make
23 inquiries as to whether or not those towers were oriented the
24 same then as they are now, and that's information you can get
25 from the phone company, from the engineers, from whatever

1 company is handling it. Ericsson is the company that now
2 handles Sprint Nextel.

3 Q. And have you gotten that information in this case?

4 A. I have called and asked, but I don't have anything in
5 writing, but I called and said -- I asked was there any
6 orientation changes to these two towers from 2010 until today
7 and was told there was not. So the orientations that I got off
8 the 2012 list, and I was told by Ericsson, they don't have a
9 record of those tower orientations being changed.

10 Q. And who was it you spoke to?

11 A. I don't have the name of who I spoke to.

12 Q. It is a fact, is it not, that cell phone companies are
13 often changing the direction of their antennas, correct?

14 A. I wouldn't say that's a fact that they often change them.

15 Q. They often add new towers, do they not?

16 A. They do add new towers. Nextel doesn't, but other
17 companies do.

18 Q. They often take down old towers, correct?

19 A. Again I don't know what we're talking about with often, but
20 there are changes in networks over time I'm sure.

21 Q. I want to just stick on this chart just for a minute since
22 we're talking about it. I assume you still have it open in
23 front of you, Summary 6.

24 A. Yes.

25 Q. You have drawn a concluding arc in two places to make your

1 intersection, correct?

2 A. I have drawn two approximated coverage areas for those
3 sectors.

4 Q. Okay. Now you just said that you didn't know what I mean
5 by often. I don't know what you mean by approximate.

6 What do you mean approximate?

7 A. That is my estimated range of coverage for that cell site
8 sector based on all the factors that I described earlier.

9 Q. All right. And let me see if I can understand what those
10 factors are. The distance from the cell tower, is that one of
11 the factors?

12 A. The distance to the next closest cell tower, correct.

13 Q. I'm sorry, the distance from other cell towers?

14 A. Correct.

15 Q. All right. Now when you say that, I can see that there is
16 two little triangles kind of up and to the left of your shaded
17 areas.

18 A. Yes.

19 Q. Are you suggesting that the radio wave stops when it gets
20 to a certain area because of the existence of the other towers?

21 A. I'm not suggesting that it completely stops. What I am
22 suggesting is that as you get closer to the next tower, the
23 signal strength from that tower becomes stronger than the one
24 you're moving further away from. And the phone wants to use
25 the tower -- the signal, the best signal that it can.

1 Q. All right. Let me talk about that for a minute because I
2 think that's one of our major areas of disagreement.

3 Who told you by name that the cell phone always uses
4 the strongest signal available?

5 A. I don't have a name to provide you.

6 Q. All right. Who told you in general that that's true?

7 A. I have had that discussion with I don't know how many
8 people from phone companies to network engineers. That is not
9 anything I have been told any differently, that the phone
10 uses -- is searching for the strongest signal to use.

11 And then it maintains a list of the weaker signals
12 and constantly evaluates that to make sure it has got the best
13 one. And when another signal becomes stronger, it selects it.

14 Q. The fact of the matter, is it not, is that a cell phone can
15 make use of any usable signal to make a call through a tower,
16 correct?

17 A. That it can make use of any usable signal?

18 Q. Yes.

19 A. If a signal is usable, can the phone use it? I guess
20 that's probably true, sure.

21 Q. Okay. Well, let me expand on that a little bit. I think
22 that you said that the way a cell phone decides which tower to
23 use is the strongest signal in its area, correct?

24 A. The tower that it is receiving the best signal strength
25 from, yes.

1 Q. All right. And that can be affected by distance, correct?

2 A. Correct.

3 Q. And obstructions, right?

4 A. Correct.

5 Q. Okay. You had not discussed, except a little bit, about
6 switching towers at one point, the amount of cell phone traffic
7 that a network is facing, correct?

8 A. Sure.

9 Q. All right. The fact of the matter is is that a cell phone
10 is in constant communication with multiple towers whenever it
11 is on, correct?

12 A. It is scanning multiple towers whenever it is on, sure.

13 Q. It hasn't made a call yet, but it is -- those towers know
14 its information, right?

15 A. Right.

16 Q. Okay. And the cell phone does not get to decide which cell
17 site it uses, does it?

18 A. I disagree with you.

19 Q. All right. Is it not true that the cellular provider
20 Sprint Nextel in this instance decides which cell tower is
21 used?

22 A. Once the call is sent to that tower, yes. The call detail
23 records are populated with the tower that the phone is selected
24 to send the transmission to.

25 Q. All right. Do you know what a switching system is?

1 A. A switching system within the network?

2 Q. Yes.

3 A. Sure.

4 Q. All right. And correct me if I am wrong, but a switching
5 system is essentially a computer that contains an algorithm or
6 a program designed to balance the load of cell phone calls
7 across the entire network, correct?

8 A. It is designed to optimize the performance of the network.

9 Q. Right. And by optimizing it, what we are talking about is
10 that to balance the calls over multiple towers so that there
11 are not busy signals and dropped calls, right?

12 A. Well, that's the objective of it, but there are dropped
13 calls. And so, you know, I don't accept that it is too spread
14 out over the entire network. It is designed to ensure the best
15 call quality that it can. So I won't say that, yes, that
16 switching center will just move a call to wherever there is
17 room.

18 Q. Well, it will move a call wherever there is room within the
19 range of the cell phones's radio signal, right?

20 A. It will move it to wherever it is going to maintain a good
21 signal with a cell phone, sure.

22 Q. Within the range of the phone, right?

23 A. Well, but, yes, the phone has to be able to communicate
24 with the tower, correct.

25 Q. And a cell phone's range can be up to 30 miles, right?

1 A. I disagree with that.

2 Q. You disagree with that?

3 Let's say in a flat rural area with no obstructions a
4 cell phone radio wave can't make it 30 miles?

5 A. I don't know that to be true. I think you're speaking more
6 in a vacuum, and so I have not tested a cell phone signal to
7 see if it goes 30 miles.

8 And even so, I have never seen a cell phone signal
9 connect with a tower 30 miles away in any circumstance. So I
10 just don't accept that, you know, because you're saying it.
11 And if you are speaking theoretically, I don't know. I don't
12 accept your conclusion. But I'm speaking in terms of the
13 reality of the -- how the network operates.

14 Q. How about 20 miles away, can a cell phone signal make it
15 that far?

16 A. I don't know how it would make it that far. When you look
17 at the number of towers -- I don't know how you would ever find
18 that out and measure it. When you're talking about in Chicago,
19 which is the network that we were discussing here, there are so
20 many towers within a 20-mile radius that I do not believe for
21 one minute that a cell phone will connect with a tower 20 miles
22 away in Chicago. I never seen it, and I don't think it can be
23 done.

24 Q. Well, the job of the systems switch or that computer that
25 we have been talking about is to balance the number of calls

1 among all those cell phone towers that you are talking about,
2 right?

3 A. I don't know that that's the case. It doesn't balance --
4 if the network is operating, call it a thousand calls, and
5 there is a thousand towers, it doesn't say, okay, each tower
6 gets one call. That's not accurate. It is designed to
7 optimize the performance of the network. That doesn't mean
8 that the one way you optimize the network is to evenly
9 distribute the calls throughout the towers. So I don't agree
10 with you.

11 Q. Take the word evenly out of it. How about to distribute
12 them as best it can in a way to not drop calls or get busy
13 signals. Nobody said anything about a one-to-one
14 correspondence.

15 How about that? Is that the job of the computer?

16 A. The job of the computer is to optimize the performance of
17 the network.

18 Q. Okay. Are you privy to that computer program?

19 A. I am not.

20 Q. You know, however, that that computer program overrides
21 proximity in selecting the cell phone tower, correct?

22 A. I know that -- look, I don't know the specifics of how, you
23 know, when you start saying that it overrides it. What I know
24 is is that program will certainly, if it fields the call -- the
25 network performance and the call quality, will be at its best

1 if it moves that traffic to another cell tower which has to be
2 a tower, and again, that's going to maintain a usable signal, a
3 good call quality signal, then it will do that.

4 Q. Despite proximity, correct?

5 A. Sure. That doesn't necessarily mean it is the closest
6 tower.

7 Q. And despite the signal strength, correct?

8 A. Well, within reasonable signal strength.

9 Q. Correct. But the computer program will override signal
10 strength from tower to cell phone, correct, if there -- if it
11 needs to balance the load out, right?

12 A. Right. If it does need to balance the load out, it will
13 move it to another tower which maybe isn't giving it the -- as
14 strong a signal as the previous tower, but will still have a
15 usable signal.

16 Q. And that happens all the time, does it not?

17 A. I don't have the statistics on it, but I have seen it in
18 the records where over a very short duration the network has
19 opted to move that call to another tower. I have not seen it
20 to move to towers of any great distance.

21 Q. It happens for more than short periods, does it not?

22 A. Oh, it certainly does. I'm saying but even in a short
23 period it can do that.

24 Q. Well, sure. But let's say, for example, I, for some
25 reason, decide to go to a Cubs game, right?

1 A. Right.

2 Q. And there are 40,000 people there, and we all know they are
3 not watching the game, they are using their phone calls.

4 A. Right.

5 Q. Right?

6 Okay. And the closest tower with the strongest
7 signal is going to get overloaded, right?

8 A. I mean, there is plans put in place for that. There are
9 multiple panels up at Soldier Field and other locations. And
10 when there is special events, they bring in other towers, so --

11 Q. All right.

12 A. So I mean --

13 Q. Let's pretend they didn't do that for the moment. Okay?

14 A. Let's pretend that they didn't do that?

15 Q. Yes. Yes.

16 The computer system would route the calls to a
17 different tower that didn't have the strongest signal, right?

18 A. If the people at the Cubs game, under our hypothetical
19 scenario, were overloading the tower, yes, travel would be
20 moved to other towers within still a usable signal strength
21 range.

22 Q. Right. And obviously we disagree on what a useable signal
23 strength range is, right?

24 A. I'm sure we do.

25 Q. Okay. And -- all right. And it doesn't only happen when

1 it is overloaded, the computer jumps in before the overload
2 happens, right?

3 I mean, these cell phone people aren't idiots, they
4 have programs that balance it out before an overload happens,
5 correct?

6 A. Again, we're getting into the weeds here on that stuff, and
7 I'm not -- I'm not going to just accept that they do that. I
8 know that these networks, they plan for what the capacity is
9 that's required is going to be. They plan for how much
10 coverage they are going to need in an area.

11 I don't think that overload is this raging problem
12 throughout networks. And on top of that, you know, they have
13 other alternatives as well. If it is a situation where it does
14 seem like, hey, look, we have got a lot of overload here. You
15 have distributed antenna site systems that can be put into
16 place, so, you know, I don't think it -- I'm not signing off
17 that there is this, you know, constant overload problem that
18 they are always adjusting for.

19 Q. Well, I didn't ask if there was a constant overload
20 problem, right?

21 What I asked was does the computer override proximity
22 to balance out the load, make their network work as efficiently
23 as possible, with the fewest dropped calls and busy signals,
24 right?

25 A. Correct, within a usable signal strength.

1 Q. All right. And that happens before the tower communication
2 is recorded on your -- the billing or historical cell site data
3 records, correct?

4 A. Here's where you and I disagree again. The phone -- so on
5 a -- when that phone makes that outgoing call and calls that
6 cell tower, that's where the call detail record is captured.
7 Now if that's moved -- you can see it in cell site -- or you'll
8 see duration. I have seen cell site records, call detail
9 records, with durations of one or two seconds that will list a
10 different originating and terminating cell site. The
11 originating is the phone that I need resources, and the network
12 said you're going here.

13 Q. That happens sometimes because the phone is moving,
14 correct?

15 A. Well, over a one second period I think that's significantly
16 less likely. But, yes, movement is another reason that traffic
17 is moved from one tower to another.

18 Q. And it is your belief that a phone -- there is a record
19 made of the cell tower that a phone connects to before the
20 computer tells it which tower to use for the entirety of the
21 call, is that right?

22 A. Right. It is my belief that the call detail records are
23 populated with the tower chosen by the cell phone. And then if
24 that call is moved, that can happen almost instantly, but the
25 call detail record reflects the resources for the call were

1 requested of this tower.

2 Q. But if there is an overload problem, you get a busy signal
3 when you try to get the tower, right?

4 A. That's exactly right, and that's why -- I don't understand
5 what you are saying. Under your scenario, you'd never get a
6 busy signal. So the reason you get a busy signal is that that
7 determination isn't made quickly enough, the resources aren't
8 allocated to another tower quickly enough, there is your busy
9 signal. There's your call fail.

10 Q. Under my scenario you can get a busy signal if there are a
11 lot of calls and it doesn't get balanced out properly.

12 A. Well --

13 Q. Under your scenario you always get a busy signal --

14 A. If that's --

15 Q. -- before the call gets transferred to another tower. So
16 what -- so the computer isn't doing any good, you get a busy
17 signal.

18 A. I feel like we're going in circles here. If it is going to
19 get -- why would it -- why would the computer allocate it to
20 another tower to give it a busy signal? I mean, that's the
21 whole point, I think, we're trying to understand with each
22 other is you're saying that the network will move it to another
23 tower because, you know, that's where it needs to be and
24 proximity won't matter. Well, if that tower is busy, I don't
25 know why the program would move it there or why the software

1 would move it there.

2 Q. I'll ask one more question before we move on from this --

3 A. All right.

4 Q. -- circular argument.

5 But under my theory, am I correct, the tower gets
6 selected by the computer before there is a busy signal?

7 A. The tower gets selected by the computer before there is a
8 busy signal.

9 Q. The cell phone is already in constant communication with
10 multiple towers --

11 A. Correct.

12 Q. -- correct, before it makes a call?

13 A. It is scanning multiple towers.

14 Q. All right. And those towers are connected to the switching
15 system, correct?

16 A. They are.

17 Q. Okay. So the switching system can tell the phone which
18 tower to use at the time of a call before it hits the busy
19 tower, correct?

20 A. I don't agree with that.

21 Q. Okay. And who told you that that's wrong?

22 A. I don't -- I can't explain to you in which training session
23 I have been in, but that -- I have heard that, I don't know how
24 many times, that the phone initiates the contact with the
25 tower. The network can immediately then move that traffic.

1 But the call detail records are populated with the tower that
2 the phone requests resources from.

3 Q. And in your view that would result in busy signals,
4 correct?

5 A. I'm saying it could result in a busy signal, I'm sure.

6 THE COURT: Would there be a record if there was a
7 busy signal?

8 THE WITNESS: Sure. It would just be -- a very short
9 duration. You know, it would -- yeah, there could be a record
10 of that. There could be no record.

11 If you couldn't even get to the point where you got
12 that busy signal that rejects you from the tower, it couldn't
13 even get through, so there was no connection of any kind, it
14 probably wouldn't even have a record of it.

15 BY MR. BLEGEN:

16 Q. You testified towards the end of your direct testimony that
17 there are some reasons why a cell phone company needs to know
18 the location of a phone, right?

19 A. Right.

20 Q. And one of the things you said is to know where the phones
21 are in an emergency. Do you remember that?

22 A. I do.

23 Q. Are you telling us that cell phone companies use historical
24 cell site data to locate phones in an emergency?

25 A. No, I'm telling you that they use cell towers to do it.

1 Q. Okay. They have -- that has nothing to do with historical
2 cell site data, does it?

3 A. No.

4 Q. The FCC has mandated that cellular telephone companies,
5 when a 911 call is made, give realtime data of multiple towers
6 so that they can triangulate the position of the cell phone,
7 correct?

8 A. That's one way that they --

9 Q. And the other way is GPS, right?

10 A. Yes.

11 Q. But one way that they specifically do not do it is with
12 historical cell site data, right?

13 A. Sure.

14 Q. They don't -- when 911 calls and says, we need to locate
15 the cell phone, they don't say, oh, it hit off this tower,
16 right?

17 A. If it calls 911 and hangs up, they are certainly going to
18 ask what tower it hit off of.

19 Q. They are going to ask what multiple towers it was
20 communicating with to triangulate the position, right?

21 A. If that can be done, sure.

22 Q. Yeah.

23 A. But that is the triangle -- that is how they triangulate
24 it, yes.

25 Q. The FCC has mandated that it be done, right?

1 A. I agree.

2 Q. Okay. And they specifically were not satisfied with
3 historical or one point or two point cell site data, correct?

4 A. I haven't read theirs rulings on it.

5 Q. Okay. Well, but you know they mandated something other
6 than what you have been testifying about, right?

7 A. You're talking about a completely different -- I'm talking
8 about historical records, and you're talking about realtime
9 records.

10 Q. I agree.

11 A. Okay.

12 Q. Realtime records are accurate to find out where a cell
13 phone is, right?

14 A. Yes, if they are available, they are certainly accurate.

15 Q. Okay. And so is GPS, correct?

16 A. Yes, GPS is very accurate.

17 Q. And the FCC has mandated those two techniques to locate a
18 cell phone when a 911 call is made, right?

19 A. That's right.

20 Q. Okay. They did not permit single point cell tower data to
21 be used to find a cell phone when a 911 call is made, correct?

22 A. I don't know the ruling on it.

23 Q. Okay. You also testified for a while about the acceptance
24 of historical cell site data to locate a cell phone in the FBI,
25 right?

1 A. Right.

2 Q. Okay. And you said it is widely accepted in the FBI,
3 correct?

4 A. Sure.

5 Q. And the FBI, including you, have taught it to other law
6 enforcement agencies, correct?

7 A. Yes.

8 Q. Have you examined the wide acceptance of historical cell
9 site data outside of a law enforcement agency?

10 A. The wide acceptance of it?

11 Q. Or how about just the general or whether there is any
12 acceptance of it outside of law enforcement?

13 A. I think there is acceptance of it outside of law
14 enforcement. I mean --

15 Q. Okay.

16 A. -- I don't know if we are considering the court as law
17 enforcement, but it has been accepted in courts at every level
18 and upheld on appeal.

19 It has been accepted by -- phone companies have
20 testified to it. So, you know --

21 Q. Have they testified --

22 A. Let me finish.

23 Q. I'm sorry. Go ahead.

24 A. When -- you know, when you're talking about wide
25 acceptance, you know, there are all kinds of studies out

1 there. There are -- they tracked down Haitian evacuees after
2 the earthquake by cell tower records. I mean, so -- yes, is it
3 accepted? I would argue it is absolutely accepted.

4 Q. All right.

5 A. It is accepted by phone companies, by law enforcement, by
6 the courts.

7 Q. Okay. Let's talk about Haiti for a minute. You -- I guess
8 you were probably part of the decision to submit the Haitian --
9 the newspaper article about Haiti to the Court as part of
10 the -- try to get past the Daubert standard here. Are you
11 aware of that?

12 A. I don't make that decision. I'm aware of the article you
13 are speaking of.

14 Q. Right. It sounds like you were the one who found it or at
15 least you saw it after somebody else found it.

16 A. Yeah, I have seen it.

17 Q. Okay. That article about people in Haiti has nothing to do
18 with the level of accuracy that you're trying to claim is
19 available here, right?

20 A. What that article details is that cell tower usage was used
21 to determine location of people that had been -- had evacuated
22 so that doctors could find these populations of people and
23 medicate them because of the Cholera outbreak.

24 Q. Found by location, you mean not in this city, in this other
25 city, correct?

1 A. By the cell towers, correct.

2 Q. All right. But it didn't say in this tiny two-block area,
3 did it?

4 A. I don't have a tiny two-block area indicated on my chart.

5 Q. All right. I'm sorry. How big do you think this
6 intersection is between -- on Summary 6 of your shaded areas?

7 A. I would say that projects out a little over a mile.

8 Q. A little over a mile. Is that north and south?

9 A. Well, from the center.

10 Q. How far east -- oh, from the center. North -- and I'm
11 sorry. Strike that.

12 A mile north from the center and a mile south from
13 the center?

14 A. What I am saying is from the center of that -- call it pie
15 shape -- out, a little over a mile.

16 Q. All right. But you -- one of the outer lines on the left
17 sector is kind of -- I guess it is covered up by the red color,
18 correct?

19 Sorry. Are we to presume that that curved line keeps
20 going down there?

21 A. Yes.

22 Q. Okay. And so you're saying that the cell phone was in that
23 area.

24 A. What I am saying is it is -- that that area where those two
25 overlap, if I was going to look for a phone based on the call

1 detail records that I was looking at in this case, if I had to
2 go look for where that phone was, that's exactly where I would
3 go look is where they overlap. And I have done that in the
4 past, and it has been successful. And I have -- I have
5 experience in actual real life investigations where in that
6 area of overlap, you can find the phone.

7 I have found victims in that overlap area, dead
8 bodies in that overlap area, fugitives in that area, and other
9 suspects in that area.

10 Q. And what's your error rate, zero?

11 A. I haven't gone out and -- with data like this where we're
12 getting consistent overlap, back and forth use of a tower, and
13 not found it.

14 Q. Right. But that historical data must be significantly more
15 recent than the data in our case, correct?

16 Let me ask it again. You didn't find dead bodies two
17 years after you did your examination, did you?

18 A. That's correct.

19 Q. You didn't find the cell phone two years later, right?

20 A. Right.

21 Q. Okay. You're talking about doing it more close in time.

22 A. Right, with the same methodology.

23 Q. And you have zero percent error rate, is that your
24 testimony?

25 A. That's correct. I have not -- I have not found this to be

1 inaccurate once.

2 Q. And I don't understand what you mean by, not found it to be
3 inaccurate.

4 Did you ever go to a place where you thought a cell
5 phone was and it wasn't there?

6 A. No.

7 Q. Did you ever go to a place where you thought either, I
8 don't know, a dead body or some person was, and they weren't
9 there?

10 A. No, not -- if I have put together a search area based on
11 the call detail reports that I am looking at, I haven't had
12 instances where we found it to be anywhere else.

13 Q. And in those previous cases, is your overlap area as small
14 as it is in Summary Chart 6?

15 A. Yeah, I have done overlap areas that are probably smaller
16 than that.

17 Q. And what about other FBI agents, have you gathered any
18 statistics about their potential error rates?

19 A. I don't have any statistics on that, no.

20 Q. Well, you said previously on direct that this -- that the
21 FBI has been -- I forget what you said exactly -- but something
22 like wildly successful or always successful.

23 A. Correct. I am not aware of a time where this methodology
24 was put in place and found to be inaccurate.

25 Q. Well, do they broadcast somewhere by email or in a posting

1 in the FBI building when they are successful using this method?

2 A. No, there is no mass email or anything about that.

3 Q. All right. And do they broadcast when they are not
4 successful using?

5 A. No.

6 Q. So are you -- is what you are telling us is that at the
7 water cooler nobody ever told you that it didn't work?

8 A. That, and at the training classes that I have been to, my
9 discussions with other agents in other field offices. Right,
10 this methodology works, and we all use it. And we have all had
11 success with it when we use it.

12 Q. All right. And you have done a survey of, you think,
13 sufficient FBI people to know that the error rate is zero.

14 A. FBI people and other law enforcement agencies. I have
15 never had a law enforcement agent say, hey, I tried this, and
16 it didn't work, it is not right.

17 Q. Okay. So word of mouth you are talking about. Nobody ever
18 said it doesn't work, right?

19 A. Correct. My -- I don't have statistics -- I don't have
20 numbers that I can cite for you.

21 Q. And you don't know -- you are not aware of any studies done
22 by the FBI or a contract with the FBI to determine the success
23 or failure rate, correct?

24 A. That's correct, I'm not aware of any studies.

25 Q. There is like a group of people within the FBI who do this

1 kind of work specifically, correct?

2 A. Yes.

3 Q. What are they called, CAST or something?

4 A. Correct.

5 Q. All right. What does CAST stand for?

6 A. The Cellular Analysis Survey Team.

7 Q. All right. And are you part of that team?

8 A. I'm in that training program right now.

9 Q. But you're not a member of the team?

10 A. I'm not a full-time member of that team, no.

11 Q. What do you get when you become a full-time member? Is
12 there like a certificate or a licensing or something?

13 A. I don't think so.

14 Q. Okay.

15 A. I think it is a completed amount of training, experience.

16 Q. All right. And are you aware of whether CAST has done any
17 peer review of its methods using cell phone technology?

18 A. I don't know if they have or not.

19 Q. All right. And to conclude this questioning about the FBI,
20 leaving law enforcement agencies aside, what other groups use
21 this historical cell site data to locate cell phones?

22 A. I don't know who else would use this to locate cell phones,
23 so I don't know. I don't know who else uses it.

24 Q. Okay. Do you know -- we already established 911 does not
25 use it, correct?

1 A. Well, we have established that they can -- that 911 seeks,
2 if not -- they can't do a GPS to triangulate with cell towers.

3 Q. So they use -- that's a realtime method.

4 A. Correct, a realtime method.

5 Q. And it's a better method, right? You acknowledge that.

6 A. What is?

7 Q. Triangulation or GPS are better methods to locate a cell
8 phone, are more accurate than historical cell site data.

9 A. Correct. If you have realtime GPS, you get a much better
10 idea of -- more precise location of where the phone is.

11 Q. And if you have realtime triangulation data, you have a
12 much better chance of locating the cell phone, right?

13 A. Yeah, you have a much -- you have a better approximated
14 area, yeah.

15 Q. All right. What about scientists, are aware if the
16 scientists use this method to locate cell phones?

17 A. I am not aware of any scientists using it.

18 Q. How about like trucking companies who want to keep track of
19 where their cargo is? Do trucking companies use this one-point
20 cell site data or historical cell site data to find out where
21 their trucks were?

22 A. I don't know what trucking companies use.

23 Q. Okay. What about companies that have groups of salesman,
24 do you know whether they use historical cell site data to find
25 out where their salesmen have been?

1 A. I have no idea how companies track their salesmen.

2 Q. All right. And you don't know whether the FBI has made any
3 efforts to essentially peer review their use of historical cell
4 site data, right?

5 A. I don't have any direct knowledge of that, no.

6 Q. All right. You said that a cell phone goes to the
7 strongest signal, correct?

8 A. Correct.

9 Q. All right. And that the strongest signal is not always the
10 nearest tower, correct?

11 A. Correct.

12 Q. What if there is a tie for strongest signal?

13 A. What if there is a tie?

14 Q. Yeah.

15 A. I guess it could go either way.

16 Q. Okay. And the tie could be a cell tower significantly
17 farther away than the nearer one, correct?

18 A. Define significantly.

19 Q. All right. A mile?

20 A. Yeah, I'll give you a mile.

21 Q. Two miles?

22 A. That I think would be pushing it.

23 Q. Why would we be pushing it?

24 A. I'm talking about the Chicago area here --

25 Q. Okay.

1 A. -- so I think that would definitely be on the outer
2 limits --

3 Q. Is there --

4 A. -- from my experience.

5 Q. You mean because there is too many towers?

6 A. Correct.

7 Q. All right. You said earlier that a cell phone, the radio
8 wave, goes out as if a pebble drops into the water, correct,
9 and goes out in all directions?

10 A. A cell phone?

11 Q. Yes.

12 A. Yeah, and I was discussing cell towers at that point.

13 But, yes, the radio frequency from a cell phone, yes,
14 it does go in all directions.

15 Q. But it also goes up too, right?

16 A. Doesn't go -- yeah, sure.

17 Q. It goes up in every direction like a bubble coming out of
18 the water, right?

19 A. Sure.

20 Q. All right. So it could go to a tower that's farther away
21 but has a stronger signal because that tower is unobstructed
22 and up in the air, right?

23 A. It can go to a tower that is further away than the closest
24 tower, yes.

25 Q. I wanted to ask you about some of your other charts. Can

1 we turn to Chart Number Summary 7.

2 And I may have been confused, and I'm sorry if I
3 misunderstood it. But what's the little -- the line for at the
4 bottom? It looks kind of like an EKG or something.

5 A. Sure. It is just -- it is a measure of the elevation of
6 the land.

7 So what that indicates is that from the two points
8 marked, there is an elevation change of five feet --

9 Q. So we --

10 A. -- at the most.

11 Q. So we just established that Chicago is pretty flat, right?

12 A. In case we didn't know, right.

13 Q. Right. But what -- I don't -- what's the point of this
14 chart, to show us that there was a -- that it would have gone
15 to that tower directly because the elevation is the same and
16 the hills wouldn't have gotten in the way?

17 A. The point is to say, to be able to say, look, I know there
18 wasn't something in between those two things to, you know, some
19 valley or hill to obstruct the ability of that phone from that
20 position to see that tower.

21 Q. Well, I don't know the answer to this, so I guess you'll
22 have to surprise me. But is this like Google topography or
23 something?

24 A. Right, it is the Google Earth Pro program.

25 Q. All right. And does Google Earth Pro take into account

1 buildings?

2 A. It is just the elevation, right.

3 Q. All right. But in Chicago the main obstructions for cell
4 phone signals are buildings, not hills and valleys, right?

5 A. Downtown they are, sure.

6 Q. All right. Well, now wait a minute.

7 What is this? I forget, is this the West Side?

8 A. It is the South. You know, it is basically -- call it 57th
9 and Western.

10 Q. All right. So I would call that the Southwest Side. Maybe
11 I'm wrong.

12 There are buildings down there, right?

13 A. There are.

14 Q. Okay. And is it your belief that none of those buildings
15 could get in the way of cell phone radio waves?

16 A. No, I'm not suggesting that at all. They certainly have an
17 influence on the cell phone waves, and that's why we can't make
18 discussions about things that are in a vacuum. There are
19 things that are affecting these radio waves down there. So,
20 buildings trees, yeah, they all affect how these -- RF from
21 that tower is affected.

22 Q. So why did you say obstructions from buildings is an issue
23 in the loop? This isn't the loop, right?

24 A. No, what I am saying is there is no skyscrapers down here,
25 there is no great changes in elevation.

1 Q. But the smaller buildings could still affect the cell phone
2 radio wave, correct?

3 A. They would certainly influence how that radio wave reacts,
4 yes.

5 Q. Which could cause the cell phone to connect with a tower
6 that is not the closest to it, right, because a different tower
7 has a stronger signal?

8 A. Correct, whatever -- right. Whatever was giving the best
9 signal is the one the phone is going to try to connect to.

10 Q. All right. But your elevation chart here was designed to
11 convince us that there is a clear path to that cell tower and
12 that's why it went to that cell tower.

13 A. That's not what it is designed to --

14 Q. What's it designed to do?

15 A. It is designed to show that we don't have any topographical
16 issues. There are going to have some influences that says that
17 signal couldn't have made it to that location.

18 Q. All right. But a building could have done that, right?

19 A. There is not a building in that line that is going to
20 prevent the signal from the cell tower getting to that
21 location.

22 Q. Okay. Did you go down and look at the buildings and see --

23 A. I have driven this area I don't know how many times.

24 Q. I know. But did you do it for this purpose?

25 A. I did. I drove -- I drove to the towers, to the different

1 locations, back and forth --

2 Q. Okay.

3 A. -- looking at what's out there, what could possibly have
4 any influence, just to confirm all that.

5 Q. And so your view is there is no hills and no buildings that
6 would have obstructed it.

7 A. Again, there are buildings, homes, tree, apartments. They
8 all have an effect on the radio frequency coming off of that
9 tower.

10 What I am saying is there is nothing that would
11 prevent, by topography or skyscraper or anything else, for that
12 signal getting back and forth between those two locations.

13 THE COURT: I have a question. Doesn't the record
14 indicate that the cell phone did get to that location?

15 THE WITNESS: Exactly. Yes, it does.

16 THE COURT: So why does it matter?

17 THE WITNESS: It is just -- you know, it is just one
18 of the things that I do to get a thorough understanding of what
19 the environment was when I am looking at these cell phone
20 records.

21 THE COURT: Okay.

22 THE WITNESS: But you're right, the fact that the
23 towers are populated in the record, and one shows they are
24 operational, and that -- you know, again, you know, I'm not --
25 I'm not saying the phone was at 5749 Seeley, I'm saying that

1 the phone -- that the signal from that tower would certainly
2 have a path to that location.

3 THE COURT: I see.

4 BY MR. BLEGEN:

5 Q. So I'm sorry if I am confused about this chart, so I
6 apologize.

7 But so what you are saying is the phone could have
8 been there at 5749 South Seeley.

9 A. Sure. That is in the coverage area.

10 Q. All right. But there is lots of other places that are in
11 the coverage area that also would have been unobstructed,
12 correct?

13 A. That's correct.

14 Q. Okay. So that's the -- I assume that's the same thing you
15 did for Summary 8, correct?

16 A. Same thing, different tower. The other tower.

17 Q. Which is to say, look, it could have gone to here, but
18 because of the topography there was nothing in the ground
19 that's blocking it.

20 A. Correct.

21 Q. But it could have gone elsewhere, correct?

22 A. Correct.

23 Q. I mean, there is no other hills or valleys to the north or
24 south of that area, right?

25 A. Correct, it is very flat around there.

1 Q. Okay. So similarly it could have gone from a different
2 tower, right?

3 I'm sorry. From the same tower but to a different
4 location.

5 A. What could have gone from the same tower to a different
6 location?

7 Q. The radio signal from the cell tower.

8 A. Yes, it could have gone to that approximated area.
9 Anywhere in there.

10 Q. You testified on direct that a cell phone is a radio that
11 communicates with towers in an area. Do you remember that?

12 A. Right, a cell phone communicates with towers by radio
13 frequency.

14 Q. In an area, right?

15 A. In an area, right.

16 Q. I think that's what you said. If you didn't, tell me you
17 didn't say it.

18 A. No, that sounds right.

19 Q. Okay. What is the area?

20 A. What is the area?

21 Q. Yeah, what are the parameters distancewise of the area?

22 A. It depends on where the phone is. I mean, it depends on
23 how the networks are set up, what tower it is going to
24 communicate with based -- are impacted by what that area looks
25 like and how the network is set up and how much radio

1 frequency, the proximity of the towers. There is a lot that
2 goes into that.

3 Q. What's the outer reaches?

4 A. Again, you're going to have to specify what area are we
5 talking about?

6 Q. Let's say -- let's start with a rural area with few cell
7 towers.

8 A. I would have to look and see, you know, how those towers
9 are situated, what the topography is of that. We can't just --
10 you have to look at a lot of factors when trying to determine
11 what that could be.

12 Q. You also told us when you used the term granulated for the
13 first time, you said that you had spoken to network engineers
14 and they have never told you that you can't granulate. Do you
15 remember that?

16 A. That's correct. If the --

17 Q. All right. I just want to know if you remember it.

18 A. If you have a cell site, if you have a cell site location
19 in the records, that's correct, then you can granulate.

20 Q. Okay. And I assume you don't know the names of those
21 engineers that you were referring to.

22 A. That's correct.

23 Q. All right.

24 A. I speak to a lot of people.

25 Q. How far in did these network engineers tell you you could

1 granulate? How close did they say you can get?

2 A. You know, it depends on what we are talking about here. If
3 you are talking about the entirety of the coverage area, then
4 you have to make your determination on what the approximated
5 coverage area. If it is within a sector, then you can
6 granulate in to the approximated coverage area of that sector.

7 But, you know, there is not a number because it is
8 based on different factors that you have to look at based on
9 each situation.

10 Q. Do they agree with you that you can get in as close as you
11 claim to be able to in this case, the network engineers?

12 A. Yes, they agree that you get in to within the approximated
13 coverage area of that cell tower sector.

14 (Brief interruption.)

15 THE COURT: Mr. Blegen, do you have a lot more?

16 MR. BLEGEN: I just have one more short area, Judge.

17 THE COURT: Go ahead.

18 BY MR. BLEGEN:

19 Q. Towards the end of your testimony, Agent Raschke, you told
20 us that that shaded area that we're talking about on Summary 6
21 is an estimated overlap area. Do you remember that?

22 A. I'm just pulling up the exhibit here.

23 Correct. Those shaded areas are the estimated
24 coverage areas for those two sectors.

25 Q. And you did the estimating, correct?

1 A. I did.

2 Q. Did you use a mathematical formula to do the estimating?

3 A. I did not.

4 Q. Did you use a computer to do the estimating?

5 A. I used a computer to do the drawings but not the
6 estimating.

7 Q. Okay. The computer to print out the map and put the shades
8 on there?

9 A. Correct.

10 Q. But you picked the lines, correct?

11 A. I did.

12 Q. And am I right that the summary of your testimony is that
13 you did that based on your experience and training?

14 A. Correct.

15 Q. But not based on any mathematical formula. Correct?

16 A. Correct.

17 Q. Computer program?

18 A. Right.

19 Q. Or any other scientific method, correct?

20 A. I did it based on my training and experience and my
21 understanding of the Nextel network in this area.

22 MR. BLEGEN: Judge, I think that's all I have.

23 THE COURT: Mr. Yonan.

24 REDIRECT EXAMINATION

25 BY MR. YONAN:

1 Q. What else did you use when you used your training and
2 experience to draw those lines on Government Exhibit Summary 6?

3 A. Well, I used the call detail records to identify where the
4 phone calls were made. I used -- and I used my computer.

5 Q. Well, and -- that was a bad question. Did you also take
6 into account other towers in the area?

7 A. Of course. I mean, that's -- when I say I do these -- I
8 thought I had covered that.

9 When I make these estimations, I take a lot of
10 factors into consideration. So -- and it is, it is the other
11 towers in the area and that's what I guess I meant by my
12 training. The orientation of these towers, you know, the
13 topography, all those considerations.

14 Q. Now you were asked some questions about Government Exhibit
15 Summary 9.

16 Actually they were about Government Exhibit Summary
17 6, about some calls that were excluded from that analysis.
18 Do you recall that?

19 A. Yes.

20 Q. Why did you exclude those calls?

21 A. Again, because I can't -- I can't verify. I don't have a
22 document to verify that. And just because of, you know, the
23 fact that I -- I think I know the answer to that. Until I can
24 get a document from them saying, look, we conclusively can tell
25 you from 2010 that is where this antenna was. But I didn't

1 want to include it in there.

2 And these -- you'll see that in the records, you
3 know, when it hits the -- I think there is one call where that
4 tower, that antenna is hit on both sides, meaning the
5 originating and the terminating, but I think you have calls on
6 -- within one minute on either side of it that are again using
7 these towers. And I think the other times that you see that
8 tower that I identified as the distributing tower, I think on
9 the other side of that call there, the originating or
10 terminating, you see one of these two towers.

11 Q. What does that indicate to you when there is calls within
12 one to two seconds of originating and terminating?

13 A. I'm sorry, say that again.

14 Q. Well, I think what you said was you see calls within a very
15 short time period using other towers, while in addition using
16 these towers. And what does that indicate to you?

17 A. Well, again, what that means is that, you know, you had a
18 call of short duration. But then when I see those calls, it
19 means that, you know -- that, you know, if a minute before and
20 a minute after we're using these two towers here, it tells me
21 that the phone likely is in the same location.

22 Q. I believe you testified on cross that there weren't changes
23 as far as you knew to the Sprint Nextel network. Do you know
24 where there are no changes to that network?

25 A. Sprint is -- they are tearing down their network. They are

1 not enhancing or making changes. They are trying to -- Sprint
2 bought Nextel in the hopes of, you know, making them kind of go
3 away and absorbing, you know, their customers. And so that
4 didn't happen as quickly as they thought.

5 But they are not -- they are not updating, they are
6 not building new towers, they are actually taking towers down
7 now and to move everybody completely to Sprint.

8 Q. Now you were asked a series of questions about your
9 conversations with various network engineers.

10 A. Yes.

11 Q. Do you recall those questions?

12 A. I do.

13 Q. And give the Court an estimate of how often you talk to
14 network engineers from these cell phone providers?

15 A. I am in contact with them regularly. A couple times of
16 week I am talking to somebody from a cell phone company. I
17 spend a great portion of my day dealing with these cell site
18 records.

19 Q. And under -- and you're dealing with them under
20 circumstances -- practical circumstances, is that right?

21 A. Correct, actual real life scenarios.

22 Q. Sometimes actual emergency scenarios, isn't that right?

23 A. Yes.

24 Q. You don't always take notes or remember -- recall the name
25 of the person you talked to on each occasion.

1 A. Correct.

2 Q. You testified that the longer the distance, the less likely
3 the radio frequency is to reach the distance. Why is that?

4 A. Well, radio frequency degrades over a distance. It is --
5 you know, it is not -- you know, it doesn't broadcast and go
6 for as long as you want it to. It degrades over distance. You
7 know, it is influenced by obstructions, and it degrades over
8 distance. It is not an infinite broadcast.

9 Q. Well, and how do obstructions play into the analysis when
10 it is traveling over a longer distance?

11 A. Well, they become more influential. You know, the signals
12 have more to bounce off, to reflect off of, to degrade. And
13 then the other thing too is, you know, then based on just how
14 they are pointing, you know, what direction are these radio
15 frequencies even pointed in. If they are pointed -- you know,
16 they are going to be pointed on some downward tilt because they
17 -- they are elevated, and so they are pointed down at the
18 direction that you want them to cover. So, you know, over
19 distance they become less and less usable.

20 Q. You were asked some questions about GPS and 911 call
21 location services.

22 A. Yes.

23 Q. Why didn't you use those in this case?

24 A. Again, those are realtime functions. GPS is a realtime
25 function. I'm looking back at the records historically.

1 Q. And why don't you use them more frequently in your cell
2 phone analyses?

3 A. Most of my cell phone analyses are historical analyses. If
4 I am working an active ongoing emergency case, then I will use,
5 you know, realtime GPS location if possible. That's not even
6 possible with all phones. You can't do it with every phone, in
7 which case you have to use historical. And historical meaning,
8 okay, it just happened, but now it is historical, so where did
9 it happen from?

10 Q. You were asked some questions about whether anyone from the
11 FBI has told you about any failures involving these failure
12 rates involving these analyses. Are you in regular contact
13 with the individuals from the CAST team?

14 A. I am.

15 Q. Have they ever told you about any failure rates involving
16 these analyses that you have talked about?

17 A. No.

18 MR. YONAN: Judge, that's all I have. Thank you.

19 THE COURT: All right.

20 MR. BLEGEN: Judge, can I just have -- I can do it in
21 a minute or less probably.

22 THE COURT: Okay.

23 MR. BLEGEN: I hope.

24 RECROSS EXAMINATION

25 BY MR. BLEGEN:

1 Q. Agent Raschke, I take it that all of your calls with these
2 electricals engineers are not in emergency mode, correct?

3 A. That's correct.

4 Q. You have had lots of casual conversations with them,
5 correct?

6 A. Sure.

7 Q. Okay. You said that there is no changes to the Nextel
8 network because they are tearing it down, right?

9 A. What I am saying is they are not building up new towers.

10 Q. Right. That doesn't mean that they haven't altered the
11 direction of their antennas over the past two years, does it?

12 A. I don't know that they haven't altered any antennas, that's
13 correct. I'm not saying that they have made no changes. What
14 I am saying is they haven't developed any new towers, new
15 locations.

16 Q. They may well have changed the angle of their antennas,
17 right?

18 A. It is possible.

19 Q. Which would throw off your charts and graphs, right?

20 A. If these towers were not orientated the same way, then,
21 yes, my approximated areas would be different.

22 Q. And you don't know if they were.

23 A. I was told that these towers have not been oriented in a
24 different way in the last two years.

25 Q. By someone who didn't give you their name?

1 A. I don't have their name, I'm sorry.

2 Q. And that was not an emergency call.

3 A. It was not an emergency call.

4 Q. You said that nobody from CAST has ever told you about
5 failures of this historical cell site location system, right?

6 A. Right.

7 Q. Have you ever asked them?

8 A. I'm in regular -- I have never said, does this ever not
9 work? We always discuss how we do it, and we provide example
10 after example after example of how it did work.

11 Q. Okay. But you never asked, hey, is there any error at all
12 to this?

13 A. I have not asked that question.

14 Q. Okay. Thank you.

15 MR. BLEGEN: That's all, Judge.

16 MR. YONAN: I have nothing more, Judge. Thank you.

17 THE COURT: All right. Thank you very much --

18 THE WITNESS: Thank you, Judge.

19 THE COURT: -- for your testimony.

20 (Witness excused.)

21 THE COURT: Well, let's -- shall we take a brief
22 recess here, Mr. Blegen?

23 MR. BLEGEN: If the government is okay -- I mean, if
24 you're -- I know we're short on time. Could we just have maybe
25 two minutes?

1 THE COURT: Okay.

2 (Brief recess.)

3 THE COURT: Do you have anything more, Mr. Yonan?

4 MR. YONAN: I do not.

5 MR. BLEGEN: Your Honor, sorry, I jumped the gun.

6 Mr. Rufo is going to conduct the direct examination of

7 Mr. Schenk.

8 THE COURT: All right.

9 (Witness sworn.)

10 MANFRED SCHENK, DEFENDANT'S WITNESS, DULY SWORN

11 DIRECT EXAMINATION

12 BY MR. RUFO:

13 Q. Good afternoon. Mr. Schenk, could you please state and
14 spell your name for the record?

15 A. My name is a Manfred Schenk. Spelled M-a-n-f-r-e-d,
16 S-c-h-e-n-k.

17 Q. Can you tell me, please, about your educational history?

18 A. I have an associate's degree in engineering from -- well,
19 it is now New Jersey Institute of Technology. I have a
20 bachelor's degree.

21 Q. What was the New Jersey Institute of Technology previously?

22 A. It was called the Newark College of Engineering.

23 THE COURT: Would you speak a little louder for me,
24 please?

25 THE WITNESS: Certainly.

1 BY MR. RUFO:

2 Q. You can just continue.

3 A. I have an associate degree in engineering, and a bachelor's
4 degree in mathematics from Rutgers University, and a master's
5 degree in mathematics from the University of Michigan.

6 Q. Can you tell me about your work history, where you worked
7 in the past?

8 A. I have worked for telecommunication companies, such as IT&T
9 and Western Union, and that's in the commercial area,
10 obviously. And then I have done a great deal of radar work
11 in -- for the military.

12 Q. Can you tell me about your work with IT&T, what
13 specifically did you do for them?

14 A. I worked on the initial design of networks and capacity
15 planning and things of that nature for cellular networks.

16 Q. When what say capacity planning, what do you mean?

17 A. The amount of traffic to any particular cell site or can it
18 in fact handle, that that's their capacity.

19 Q. Were you responsible for determining how the network is
20 optimized?

21 A. Indeed. The ability to spread the load of a cell or cell
22 site and what those capacities in fact were, yes.

23 Q. You also said you worked for Western Union or with Western
24 Union. Can you tell me what you did for them?

25 A. Yes, I worked on voice communications systems and

1 specifically on some of their accounting and billing systems.
2 Just specifically what's called their money -- basically their
3 money order system. And my tasks there were to do software
4 development to that particular end.

5 Q. Can you state what you meant by their voice communication
6 system?

7 A. Well, they have private communications systems that Western
8 Union had, and we were involved in the planning and development
9 of those, sort of maintenance thereof actually.

10 Q. Do you belong to any professional organizations?

11 A. I do. I belong to the I triple E, which is the Institute
12 for Electrical and Electronic Engineers.

13 Q. Can you describe a little bit what the I triple E does?

14 A. They are interested in various engineering areas, and
15 certainly the area of telecommunications being one of them.
16 And they are also involved in pattern recognition of the areas
17 and things of that nature. So it is a very, very large, almost
18 400,000 member organization of engineers that -- and technical
19 people that are interested in electronics and electronic
20 systems.

21 Q. Does that work involve the study and operation of cellular
22 telephone networks?

23 A. Yes, that is one of the areas.

24 Q. Where are you currently employed?

25 A. I'm currently employed with Cherry Biometrics.

1 Q. What is Cherry Biometrics?

2 A. They are a company that provides expert witness testimony
3 in the area of cell phone forensics, image processing, as well
4 as fingerprint analysis.

5 Q. I should ask this before we move on, have you ever worked
6 with radio frequencies?

7 A. Yes.

8 Q. In what capacity?

9 A. Very frequently. I worked with various military systems,
10 as well as space systems that were all involved with radio
11 frequency and radio frequency technology.

12 Q. What sorts of radio frequencies have you worked with with
13 regard to the military?

14 A. I worked for two systems for the United States Navy. One
15 of them was a shipboard missile avoidance system, and the
16 second one was the communications with the Triton submarine.
17 So we had cryptographic information, information that had to
18 transmit to submarines. And those particular techniques use a
19 technique called very low frequency RF. So it is --

20 Q. Does RF stand for radio frequency?

21 A. It does, yes.

22 Q. You testified previously that you are familiar with
23 cellular telephone networks. Do you keep current on your
24 knowledge with cellular telephone networks?

25 A. I try to, yes.

1 Q. How do you do that?

2 A. Mainly by keeping up with articles and literature that in
3 fact is published by I triple E, as well as other sources. And
4 mainly through the internet.

5 Q. Are you familiar with the workings of cell phone networks?

6 A. Yes, I am.

7 THE COURT: With the what?

8 MR. RUFO: The workings of cell phone networks.

9 BY MR. RUFO:

10 Q. Have you been qualified as an expert in cell phone networks
11 before?

12 A. Yes, I have.

13 Q. How many times have you been qualified?

14 A. Something on the order of 10 to 12 times.

15 Q. Did those qualifications involve testimony?

16 A. Yes, it did.

17 Q. Now you were in here, and you heard the testimony of Agent
18 Raschke earlier. Are you familiar with the technique that
19 Agent Raschke explained to the Court, the granulization of cell
20 phone data?

21 A. I'm not familiar with it in those particular terms, but I
22 certainly understand what he is alluding to, which is an
23 attempt to narrow the area where a cell phone signal source
24 could possibly be located.

25 Q. Have you seen this technique used before or testified about

1 before?

2 A. Not quite in those particular terms, no. But, you know --

3 Q. Have you seen methodology similar to this testified about?

4 A. Yes. I mean, the -- the methodology is not, not novel in
5 any way. The attempt obviously is in order to narrow the area
6 where a cell phone signal source could be located.

7 Q. Have you seen the use of historical call data records to
8 locate a cell phone used outside of the law enforcement
9 community?

10 A. No, I have not.

11 Q. Do you know if this technique has attracted widespread
12 acceptance in the cellular network community?

13 A. It has not.

14 Q. Have you ever seen this method subjected to peer review or
15 publication?

16 A. It has not.

17 Q. Are you aware of any error rate or testing of the
18 technique?

19 A. The error rate is impossible because there is no
20 measurement that you could correlate an error with. So this is
21 a subjective method, and it is not based on any science or
22 scientific measurement.

23 Q. Is that because it is simply an estimate?

24 A. Yes, it is an estimate, that is correct.

25 Q. Do you think that Agent Raschke's method provides a

1 reliable method of locating a cell phone?

2 A. No, it cannot because he's using a single source for --
3 from a cell call detail record, and from that single source I
4 mean you cannot locate or position any radiating source.

5 Q. You probably answered this question, but do you think that
6 Agent Raschke's method uses sufficient data points?

7 A. No, because he's only using one data point, and from one
8 data point you cannot estimate as to where a source is located.

9 Q. Do you know if agencies that are involved in the location
10 of cell phones, such as the FCC, in an emergency use this
11 method?

12 A. No, they don't use this method, they use a GPS method or a
13 triangular lateralization method.

14 Q. Have you ever seen a company, such as a trucking company,
15 use this method?

16 A. No, they do not.

17 Q. Have you ever seen corporations that track the use of sales
18 or the location of salesmen use this method?

19 A. They do not.

20 Q. We'll get back to Agent Raschke's testimony in a little
21 bit.

22 But first I'd like you to give us a brief overview --
23 I know we probably heard a little bit of this -- but about the
24 layout of the cell phone network. Can you tell me about how a
25 cell phone is laid out in a city such as the United States --

1 or a city such as Chicago?

2 A. Well, I mean, a cell phone, it is a radio, as Agent Raschke
3 says. And it in fact radiates out a signal. That signal is
4 intercepted by one or multiplicities of towers. And based upon
5 that the information is sent back to the electronic switch, and
6 it is called an MSC, that will then record as to where that --

7 Q. Let me slow you down. I'm sorry to interrupt. But you
8 said the cell phones radiate out a radio frequency.

9 A. Correct.

10 Q. In what direction?

11 A. 360 degrees. They are omni directional.

12 Q. So that includes not only east, west --

13 A. North, south, and up and down.

14 Q. And can you tell me the range of this radio frequency?

15 A. The standard cell phone operates at .6 watts. And as such
16 you can make a calculation using the speed of light and
17 frequencies that in fact are used that An RF signal from such a
18 source, .6 watts, has the capability of reaching out
19 theoretically to 31.2 miles, at which point the signal is
20 exhausted, so --

21 Q. That 31.2 miles, is that a product of a calculation?

22 A. That is the product of the calculation, that's correct,
23 yes.

24 Q. That number is not an estimate?

25 A. That is correct.

1 Q. Now is that 31.2 mile number a reliable number to use in
2 the real world?

3 A. No, not really because at the edges of those -- at those
4 far distances, your signal quality would be so low in the noise
5 that it probably would not be useable and functional certainly,
6 so therefore that's not a realistic number.

7 And also depending upon what type of technology is
8 utilized, if it is CDMA technology, which some cell phone
9 companies operate on, in fact the majority in the United States
10 operate on what's called CDMA, it is Code Division Multiple
11 Access, Mobile Access, you would step on your own signal at
12 approximately 22, 23 miles or so.

13 So for general purposes, let's assume that a cell
14 phone can have a decent signal for approximately 20 miles.

15 Q. So does 20 miles represent a reasonable estimation of the
16 range of a cell phone?

17 A. Yes, it is.

18 Q. And is that a reasonable estimation of the range of a cell
19 phone in the city like Chicago?

20 A. Potentially, yes, because there is nothing that's going to
21 stop a radio frequency signal from radiating out to that
22 particular level. The main problem, obviously, in Chicago is
23 you potentially have building obstructions or things of that
24 particular nature which will in fact absorb a radio frequency
25 signal and therefore will shorten that distance.

1 Q. We have heard the testimony about hills, valleys will
2 affect the range of a cell phone.

3 A. Yes.

4 Q. Is it true that cell phone ranges travel farther in flat
5 terrain?

6 A. Yes, it does.

7 Q. And is that because there is no -- or fewer obstructions in
8 the way?

9 A. That is correct.

10 Q. If a cell phone radiates out to an estimated range of 20
11 miles, does that mean that there are a number of cell phone
12 towers that a cell phone can connect to at any given time?

13 A. That is correct.

14 Q. And what determines which tower a cell phone will connect
15 to?

16 A. Mainly the capacities that are being experienced by the
17 network at that instant in time, and --

18 Q. When you say capacities, what do you mean?

19 A. I'm talking about call volume.

20 Q. Cell phone traffic?

21 A. Cell phone traffic.

22 Q. Is the capacity of a tower limited?

23 A. Yes, highly limited.

24 Q. What limits the capacity of a cell phone tower?

25 A. The number of radio channels that that tower is capable of

1 emanating.

2 Q. Are there a limited number of radio channels?

3 A. Yes, there are.

4 Q. And how many radio channels does a cell phone call use?

5 A. It uses three. Since the conversation is what is called a
6 duplex conversation, you need to assign one radio channel for
7 your conversation going out and another channel in order to
8 receive your radio communication from the other party. And
9 then there is a third channel assigned, which is called a
10 control channel, which continuously monitors the quality of the
11 signal for the duration of your cell phone conversation.

12 Q. We heard testimony that the goal of a cell phone company is
13 to optimize network traffic.

14 A. That is correct. That's how they make their business, and
15 that's what they are being paid for is in order to provide
16 effective and efficient telecommunication service.

17 Q. Are cell phones also interested in limiting the number of
18 dropped calls or busy calls?

19 A. Oh, absolutely. If there is too many drops calls, you're
20 going to go to a different service provider, and so, therefore,
21 it behooves you to have the minimum number of those possible.

22 Q. Did cell phone towers ever malfunction?

23 A. Sure. Absolutely. They can malfunction due to atmospheric
24 conditions, you know, thunderstorms, you know, lightning
25 strikes, things of that particular nature.

1 Q. If a cell phone tower malfunctions, does that leave a dead
2 zone in the middle of a cellular network.

3 A. No, it does not.

4 Q. Why not?

5 A. Because neighboring towers would in fact instantly pick up
6 the traffic that would be within that area.

7 Q. So am I correct in saying that if I am in a particular
8 place, multiple towers are capable of picking up a phone call?

9 A. That is correct.

10 Q. You mentioned the electric switch. Is that also known as a
11 mobile switching center?

12 A. Yes, it is.

13 Q. What does a mobile switching center do?

14 A. A mobile switching center certifies that a subscriber is
15 permitted to use that network. It in fact will look at the
16 accounting database to determine whether your bill has been
17 paid and whether you in fact can connect with this particular
18 call. And ultimately, if you are authorized in order to do so
19 and the other party on the other end is also authorized to do
20 so, then the mobile switching center will assign the three
21 frequencies that we indicated in order to connect a call.

22 Q. Does it assign a phone call to a particular tower?

23 A. Yes, it does.

24 Q. Is the assignment of that tower controlled by the algorithm
25 that Agent Raschke was talking about?

1 A. Yes, it is.

2 Q. And are you privileged to know the algorithm that Sprint
3 uses?

4 A. No, I am not. It is -- these are company trade secrets.
5 And the decision that is utilized in order to optimize the
6 efficiency or capacity of a network is proprietary information
7 to the cell phone providers.

8 Q. Do you know whether a cell phone always is routed to the
9 tower with the strongest signal?

10 A. There is no necessity for that in order to happen. All a
11 cell phone or mobile switching center needs is an acceptable
12 signal. And as I indicated earlier, a cell phone is radiating
13 out and it is in contact with multiple cell towers. And the
14 mobile switching center would know what those towers were and
15 what the call quality of those towers in fact are. And as long
16 as it has an acceptable signal quality, it can in fact make an
17 assignment to any of those cell towers in order to complete the
18 connection.

19 Q. Am I correct that a cell phone at any given time has a
20 choice among acceptable signals?

21 A. The cell phone is -- the cell phone does not choose. The
22 cell phone is like the remote control on your TV, it doesn't
23 choose which particular TV channel that you are going to
24 watch --

25 Q. That was a bad question.

1 Am I right to say that a cell phone can be routed to
2 any number of acceptable signals?

3 A. That's correct.

4 Q. And that routing is done by the mobile switching center?

5 A. That is correct.

6 Q. And when that mobile switching center routes a phone call
7 to a tower, is that tower recorded?

8 A. Yes.

9 Q. What is it that tower recorded on?

10 A. That's recorded in the call detail records, and it is the
11 originating tower.

12 Q. And is that originating -- that originating tower is not
13 necessarily the one with the strongest signal?

14 A. It does not have to be, no.

15 Q. Is it necessarily the tower with the closest proximity?

16 A. It does not have to be, no.

17 Q. Is the tower that a cell phone network has determined is
18 the optimal tower to balance the load of phone calls?

19 A. Yes. I would say yes.

20 Q. Can the assignment of a tower for a particular phone call
21 be affected by factors far away from the phone?

22 A. Yes, it can, right. If you have a, you know, heavy network
23 traffic, you know, a traffic jam on a highway or whatever else,
24 you will very, very quickly use up the capacity of the nearest
25 towers, et cetera. At which point the network is going to

1 switch your call request to neighboring towers.

2 Q. Would the people away from the traffic jam then have their
3 phone calls then routed elsewhere as well?

4 A. Yes.

5 Q. I think we have -- we saw a couple areas of disagreement on
6 cross examination with Agent Raschke's testimony. Agent
7 Raschke testified that the range of a tower is, in a city like
8 Chicago, approximately one to two miles. Do you agree with
9 that?

10 A. That may very well be the case. It obviously depends upon
11 the volume of traffic. And the idea of using multiple numbers
12 of cell towers is in order to be able to handle that particular
13 traffic.

14 Q. I'm not sure I followed that answer. Does a radius of one
15 to two miles around a cell site represent an appropriate
16 estimate of the range of a tower?

17 A. Well, I don't think that you can in fact estimate to the
18 range of a tower because, as I indicated, nothing stops the RF
19 signal if it has a line of sight and it has no obstructions,
20 then the radio signal is going to continue on and probably be
21 usable for 20 miles.

22 So to say that a particular cell site covers
23 one -- one mile radius or, you know, a three square mile area,
24 whatever, that may be true. It may -- it need not be true on
25 the scientific, because as I indicated, radio frequency signals

1 carry on.

2 Q. Does the proximity of a cell site to another cell site
3 affect the strength of the signal?

4 A. It does not. They are independent.

5 Q. So do you agree with Agent Raschke that you can estimate
6 the range of a cell site based on its proximity to other
7 towers?

8 A. No.

9 Q. Is that consistent with the properties of radio
10 frequencies?

11 A. That is correct. They are independent. So one radio tower
12 has no affect on another radio tower. And historically the way
13 that radio towers were in fact constructed is that as the
14 capacity on Radio Tower A and Radio Tower B, it increased to
15 the point where it was appropriate to put an additional tower
16 in between those, then that is the way that the network was in
17 fact built.

18 THE COURT: Do you mean as demand increased?

19 THE WITNESS: Correct. The number of call volumes.
20 If you -- if you reached capacity or near capacity on two
21 towers, then it might behoove you to put another tower in
22 between such that it would in fact absorb some of the load of
23 those other towers.

24 So in reverse, if now the middle tower in fact, you
25 know, is being modified, upgraded, goes out, needs to be

1 maintained or whatever else, the two previous towers that were
2 there that were absorbing that particular traffic and handling
3 that traffic, they would do so again.

4 So the idea is in order to provide overlap and to
5 provide redundancy within the system such that any particular
6 piece in fact goes down, you still have a functioning network
7 that would be operating.

8 THE COURT: Well, if that's the case, that it is just
9 added as the volume increases, they could put them all in a
10 central location then, couldn't they? Or, you know, like four
11 or five areas around the city if they -- if 20 miles is
12 sufficient?

13 THE WITNESS: Except that the fact that we're not
14 taking into consideration potential obstructions and things
15 of that nature.

16 THE COURT: Back to you.

17 MR. RUFO: Thank you.

18 BY MR. RUFO:

19 Q. Do you have a copy of the government's binder in front of
20 you?

21 A. I do not.

22 MR. RUFO: May I approach?

23 THE COURT: Yes.

24 BY MR. RUFO:

25 Q. Mr. Schenk, I have just handed you the government's exhibit

1 binder. And I would ask to you to turn to Government's Exhibit
2 Summary 6.

3 A. I'm there.

4 Q. Now I'm looking at two, essentially, pieces of the pie
5 radiating out from the cell phone tower.

6 A. Yes, they are in highlighted in a reddish color.

7 Q. And do you see where the radius ends and forms a portion
8 of a circle?

9 A. Yes.

10 Q. Do you agree with the length of the radius of those towers?

11 A. No, I do not, because as I indicated earlier, the RF signal
12 will in fact continue until it meets some sort of an
13 obstruction, be it terrain, be it building, be it ground.

14 Q. You may have answered this question before, but is there
15 any reason why there is only the small level overlap according
16 to the government's chart?

17 A. In my opinion there is no justification for that, no.

18 Q. If you were to prepare a chart in this matter, would you
19 make the radius of these -- of the cell phone towers much
20 larger?

21 A. Potentially, yes, because as I indicated you probably have
22 a usable signal, you know, that could be potentially 20 miles
23 away that could use that particular tower, assuming there were
24 no obstructions and all of those conditions. Line of sight is,
25 of course, one of the main considerations.

1 Q. Once a cell phone has connected to the mobile switching
2 center, does proximity play a factor?

3 A. No, it does not.

4 Q. What plays a factor in assigning a cell phone and tower?

5 A. Just mainly the call volume that each particular cell site
6 is assigned in order to handle. As long as it has a quality
7 signal that is adequate and appropriate, it could be -- can be
8 any tower.

9 Q. If the government were correct that cell phones always go
10 to the strongest signal --

11 MR. YONAN: Objection, Judge, that's not the
12 government's testimony.

13 BY MR. RUFO:

14 Q. If Agent Raschke is correct that the cell phones primarily
15 go to the strongest tower signal, what would be the
16 repercussions of that, in a building such as this or a location
17 such as the loop?

18 A. Well, the implication would be that if all subscribers
19 within a confined area would all go to, quote unquote, the
20 strongest signal, then that particular cell site would be very
21 rapidly overwhelmed and could not handle the traffic.

22 Q. What would happen if the cell phone were overwhelmed and
23 could not handle the traffic, what would happen to the actual
24 people trying to make calls?

25 A. They wouldn't get a service or call or alternatively their

1 calls would be dropped or, you know -- yeah.

2 Q. If the government's theory is correct then how would a cell
3 phone that is having dropped calls or no signal connect to the
4 mobile switching center?

5 A. It is not capable.

6 Q. Is that why the mobile switching center assigns a cell
7 phone to a tower prior to going to the nearest tower?

8 Let me strike that question.

9 Is that why a cell phone signal is taken to the
10 mobile switching tower before it is assigned to an originating
11 cell phone tower?

12 A. Yes. The mobile switching center is attempting to balance
13 the load over all of its resources as best as it can and
14 prevent overload of any one particular resource.

15 Q. If the mobile switching center didn't assign phone calls to
16 towers, would overload be a problem in areas like downtown
17 Chicago?

18 A. Well, of course, of course. Of course, because you have
19 many, many, many subscribers, and they cannot all go to the
20 nearest tower with the strongest signal. You know, as I
21 indicated before, that particular tower would be overwhelmed
22 immediately, et cetera, et cetera, and then everyone else
23 beyond the capacity would not be getting service. So at which
24 point you're going to switch service providers, and you have
25 just lost the business.

1 Q. You would switch service providers to a --

2 A. To a more rational service provider that in fact would
3 provide rational balancing over its entire network.

4 Q. Would that rational cell phone company assign a phone call
5 to a tower after it went to the mobile switching center?

6 A. I'm not sure I understand the import of your question. Can
7 you rephrase it, please?

8 Q. Well, Agent Raschke testified that cell phones go to the
9 tower with -- usually go to the tower with the strongest
10 signal, then are routed to the mobile switching center, and
11 then are rerouted to another tower.

12 A. Well, that's -- again that's a backwards kind of a way of
13 looking at it. And as I indicated if that were the sequence of
14 events, then you would instantaneously overload one particular
15 tower and not provide service. So what would be the point of
16 doing that when in fact you have resources available that can
17 in fact accommodate your traffic? And all you have to do is in
18 fact balance it out.

19 Q. So am I correct that you would disagree with Agent Raschke
20 when he said that it is the phone that chooses the tower it
21 uses?

22 A. I would disagree with Agent Raschke, that is correct.

23 Q. Right.

24 A. The phone does not make any choices. The mobile switching
25 center makes the assignments of the channels and the radio

1 frequencies that are used in order to complete a call. After
2 it has in fact determined all of the accounting information
3 that is required in order to permit that particular call in
4 order to complete.

5 Q. Is the routing of a cell phone through the mobile switching
6 center dependent on what's happening in other parts of the
7 network?

8 A. To the extent of for balancing capacity, yes. Otherwise,
9 no. That is to say, it is independent of distance. It is
10 independent of signal strength, as long you have an acceptable
11 signal strength whatever, so --

12 Q. Have you ever seen any replication of the traffic volume
13 and particular network characteristics of a cell phone at any
14 given date and time?

15 A. From the standpoint of looking at call detail records, yes,
16 I have.

17 Q. Well, could you look at, say, April 24th, 2010, and say the
18 mobile switching center was switching calls to this tower for
19 this reason?

20 A. I have no information in regards to what mobile switching
21 center is doing at any instance in time, much less two years
22 ago. There is no information on the call detail records that
23 indicate which particular towers are busy, which are not busy,
24 or what the decision or logic is that the mobile switching
25 center was utilizing at that instant in time.

1 Q. We talked briefly about this earlier. Are you familiar
2 with the FCC requirements for tracking cell phone companies
3 are?

4 A. Yes, I am.

5 Q. What do they use?

6 A. They use two methods. GPS, being the preferred method,
7 which of course is global positioning satellites. And there
8 are 26 of them in orbit. Two of them are spares. Twenty-four
9 are operating continuously. And or typically a cell phone is
10 in -- typically in contact with anywhere between six to ten of
11 them simultaneously. So by using time of arrival differences
12 in terms of what -- the GPS chip in your cell phone can
13 determine your GPS position.

14 Q. When you say time of arrival differences, what do you mean?

15 A. The distance to the different satellites is going to --

16 MR. YONAN: Judge, I'm just going to object on
17 relevance. I don't know what this has to do with anything.

18 THE COURT: Yes, we're short of time. Is this
19 relevant?

20 MR. RUFO: Well, we'll be explaining the differences
21 between this method and methods that are approved by the FCC.

22 MR. YONAN: I don't think it is relevant. I think it
23 has been testified to. I think it has been cross examined on.
24 And I don't think it is relevant frankly, Judge.

25 THE COURT: I would suggest that maybe this

1 triangulation method would be more relevant than GPS because it
2 doesn't deal with cell phone towers, right? GPS does.

3 MR. RUFO: Fair enough.

4 BY MR. RUFO:

5 Q. Are you familiar with triangulation?

6 A. I am.

7 Q. How are cell phones triangulated?

8 A. Basically by the same technique as GPS, again by time of
9 arrival differences. And basically the further a signal has to
10 travel, the longer it is going to take. And so therefore if we
11 can use multiple towers, a minimum of three, we can determine
12 the slight time differences that those round trips in fact take
13 to those three towers.

14 Q. Are these time differences based on measurements?

15 A. Yes, they are. They are -- they are recorded by the cell
16 phone -- by the towers. And as I said, a minimum of three have
17 to cooperate and operate simultaneously in order to make those
18 measurements.

19 Q. Are they recorded in realtime?

20 A. Yes, they are.

21 Q. And have you ever seen time of arrival data on a call
22 detail record?

23 A. I have not.

24 MR. RUFO: One second.

25 (Brief interruption.)

1 MR. RUFO: I have nothing further.

2 THE COURT: What was your last question, have you ever
3 seen?

4 MR. RUFO: Time of arrival data on a call detail
5 record, the historical cell site data.

6 CROSS EXAMINATION

7 BY MR. YONAN:

8 Q. Good afternoon, Mr. Schenk.

9 A. Good afternoon.

10 Q. There is a lot of Agent Raschke's testimony that you don't
11 disagree with, is that correct?

12 A. That is correct.

13 Q. So I'm going to refer you to Government Exhibit Summary 1,
14 which should be in the binder there in front of you.

15 Do you have that?

16 A. I do.

17 Q. Now you don't disagree that this cell phone (773)447-4481
18 used that cell tower listed in the map on approximately 7:54

19 A.M, is that correct?

20 A. If that's what the call detail records indicates, I have no
21 way of disproving that that is not accurate, so I assume that
22 it is accurate, yes.

23 Q. It is a fact, isn't it?

24 A. Yes.

25 Q. And you had the opportunity to disprove that if you wanted

1 to, and you chose not to.

2 A. That is correct, yes.

3 Q. The same would go for Summary Exhibit 2, wouldn't it?

4 You have no basis to disagree with the conclusion
5 that this phone on these two locations started on the tower
6 listed ending in 46773 and ended at the tower listed on 2015,
7 is that correct?

8 A. That's correct.

9 Q. Fair to say for any of the summary charts here that reflect
10 calls hitting onto or off of towers, you're not disagreeing
11 that those phones used those towers at those times?

12 A. That's correct, I do not disagree.

13 Q. And if I heard your cross examination or your direct
14 examination correctly, you don't even necessarily disagree that
15 the phone is searching for the strongest signal, do you?

16 A. That's correct.

17 Q. You don't disagree with that notion?

18 A. I do not disagree with that notion.

19 Q. There are other -- there are a number of factors that could
20 play into what is the strongest signal, and you would agree
21 that the distance to the tower is one of those factors,
22 wouldn't you?

23 A. That is correct, yes.

24 Q. So you don't disagree with Agent Raschke's testimony on
25 that in that regard, do you?

1 A. Only to the extent that the cell phone is searching for a
2 particular quality signal. The quality signal is being
3 determined by the MSC, by the master switch controller.

4 Q. But the --

5 A. Mobile switch.

6 Q. -- phone actually has to hit a tower before the switch can
7 take an effect, right?

8 A. The phone is always hitting multiplicities of towers
9 announcing its existence and announcing its identification
10 number to the mobile switching center.

11 Q. So it is hitting off -- the switch is actually connected to
12 the tower, isn't that right?

13 A. Yes, of course, yes.

14 Q. So it is hitting off of a tower, and that is why it is
15 called a switch, it is switching to another tower, isn't that
16 right?

17 A. Yeah, yeah, yeah. It is also switching to the landline
18 network and, you know, and doing all sorts of other things,
19 yes.

20 Q. No disagreement there.

21 But what I am saying is it is actually hitting -- the
22 phone is actually -- the radio wave is actually hitting the
23 tower, and then it is being switched.

24 A. That's a possibility, yes. If the phone is in motion, then
25 obviously we're going to probably be switching towers, yes.

1 That would be one condition, yes.

2 Q. And it is at that point when the call detail record is
3 generated is that when that phone hits that tower, isn't that
4 right?

5 A. When the call is certified through the accounting system
6 and determined to be valid and legitimate and your bill has
7 been paid and all of those things that happen, then, yes, you
8 can connect to the other side of the phone, and all of those
9 things are accurate, et cetera, et cetera, then ultimately the
10 mobile switching center will assign the frequencies in order to
11 connect that call, yes.

12 Q. But the call detail record is generated prior to that
13 switch being made, isn't that correct, sir?

14 A. A switch being made? No, the call detail record is being
15 made at the time that the -- that the channel assignments in
16 fact are assigned. That would be the -- that would be the
17 initial tower.

18 Q. So what you are saying is at the time the phone hits the
19 tower, right?

20 A. The phone is hitting multiple towers, yes.

21 Q. Well, the time that the radio wave hits the tower that's
22 making the switch, correct?

23 A. Yes, okay.

24 Q. Do you know when a call detail record is populated, sir?

25 A. I'm sorry?

1 Q. Do you know when a call detail record is generated?

2 A. Yes, indeed, I do.

3 Q. How often did you look at call Detail records, Mr. Schenk?

4 A. On numerous occasions where I have been involved in
5 courtroom testimony, I typically look at call detail records,
6 yes.

7 Q. We'll get to that in a second.

8 But, so just to clarify, you're not disagreeing with
9 Agent Raschke's testimony that typically the strongest signal
10 is the closest obstructed tower -- unobstructed tower to the
11 phone, is that correct?

12 A. That may very well be true, yes.

13 Q. Because it wouldn't make sense otherwise, would it, sir? I
14 mean, these are -- these cell phone companies operate on
15 efficient networks, is that right?

16 A. Yes. But as I have also tried to stress is their main
17 function is in order to use their resources as best as they as
18 can. So, therefore, they would attempt in order to balance the
19 load across the entire network.

20 Q. And when you're talking about a cell phone -- a radio wave
21 crossing, you know, 20 miles, you're talking about in a vacuum,
22 aren't you?

23 A. No, I'm talking about air. But it is --

24 Q. Well --

25 A. There is not that much Difference to radio frequency

1 signals, that's right.

2 Q. You're not taking into account obstructions, correct?

3 A. I'm suggesting that you have a line of sight, that's
4 correct, yes.

5 Q. And you're not taking into account other towers within that
6 frame, are you?

7 A. Other towers are relevant.

8 Q. Why are other towers relevant?

9 A. Why would they be relevant? The radio frequency signal
10 just continues on. It hits one tower, it goes to another
11 tower, it goes to another tower, it goes to another tower. It
12 is irrelevant as to how many towers that there are from Point A
13 to Point B.

14 Q. Why would it keep going if it hits off of towers closer to
15 it?

16 A. Because that's the way radio frequency signals work. They
17 don't pay any attention to how many towers that they pass by.

18 Q. They are just searching for the farthest one away.

19 A. No, no, they are not searching for anything. They just are
20 sent out, and they just keep on going until they have exhausted
21 their energy.

22 Q. Have you ever analyzed a call detail record in an urban
23 area that shows a phone hitting off a tower 20 miles away?

24 A. In an urban area, I'm not aware --

25 Q. Well --

1 A. I'm not aware of that, no.

2 Q. That would be more typical of a rural area, wouldn't it?

3 A. Indeed it would, yes.

4 Q. Now you also testified that -- I think you have -- part of
5 the disclosure that was made in this case about your testimony
6 was that a phone or a tower which radiated about 120 degree
7 angle upwards to what you have described as approximately 20
8 miles, would that be correct?

9 A. That's correct. If it is a sectorized tower, then it -- that
10 is typically the case, yes.

11 MR. YONAN: Your Honor, may I use the board here for
12 demonstrative?

13 THE COURT: Yes.

14 MR. YONAN: Can you see this?

15 BY MR. YONAN:

16 Q. Can you see this?

17 I'll call this tower here Tower 2. And let's just
18 assume Tower 2 has a directional antenna west. So what you are
19 -- and west is facing this way.

20 So what you are saying is this would -- excuse me --
21 this is a 120 angle. It may not be perfect. Essentially just
22 out 120 degrees, upwards of 20 miles, is what you are saying?

23 A. Yes.

24 Q. Let's assume that we have another tower, Tower 1, and that
25 tower faces east. Isn't true that that would also sit 120

1 degrees, what you are saying is upwards of 20 miles?

2 A. Yes.

3 Q. There is another area between those two towers that
4 overlaps, is that correct?

5 A. That is correct.

6 Q. That is a redundancy built into the network so that it is
7 efficient, isn't it?

8 A. It is a redundancy built in the system, yes.

9 Q. If the cell phone frequently over -- a consistently over a
10 time period hits off those two towers, sir, isn't it in between
11 that coverage area?

12 A. It may be, it may not be. I don't -- I mean, I do not
13 know.

14 Q. It certainly could be.

15 A. It certainly could be.

16 Q. And it certainly suggests that it would be, doesn't it?

17 A. It certainly could be, yes.

18 Q. Have you ever published any work in this field?

19 A. Yes, I have.

20 Q. What have you published?

21 A. Well, we wrote one particular article for Judicature
22 Magazine, which I think was published last January, in regards
23 to cell phone forensics.

24 Q. Other than IT&T you have never worked for a phone provider
25 of any kind, have you?

1 A. That is correct.

2 Q. IT&T, when did you work for IT&T?

3 A. In the '70s.

4 Q. Okay. And you worked on their cellular phone network in
5 the '70s, sir?

6 A. Indeed we were doing some very -- or some of the early
7 development work, yes.

8 Q. Would you agree with me that the technology has changed
9 quite a bit since the '70s?

10 A. I would agree with you.

11 Q. Would you agree with me that IT&T is now a -- far from a
12 phone provider, is that correct?

13 A. Well, it depends upon where. I mean, certainly on an
14 international basis they are a phone provider in various parts
15 of the world, but certainly not a significant provider here in
16 the United States.

17 Q. You talked about your experience at Western Union. When
18 did you work at Western Union?

19 A. '70s and '80s.

20 Q. And when you're describing the system that you used or that
21 you helped develop at Western Union, that wasn't a cellular
22 phone system, is it?

23 A. It was not. That is correct.

24 Q. So that has no relevance to what you are testifying here
25 today, does it?

1 A. That's a telecommunication system, whatever. So I'm
2 familiar with telecommunication systems in general. And as I
3 indicated, I have lots and lots of RF experience in military
4 areas.

5 Q. And would you agree with me that the technologies in cell
6 phone and telecommunications systems have changed quite a bit
7 since you worked for Western Union in the '70s, wouldn't you?

8 A. Yes, I would -- whatever -- expect the -- let's see. I
9 think the patent on the automobile was January the 29th, 1886.
10 The gas pedal was on the right, and the brake pedal on the
11 left.

12 Q. Sure. But, you know, we're talking now about cell towers,
13 switching systems, radio frequencies, populating over areas of
14 time. A lot has changed since then, hasn't it, sir?

15 A. Indeed. But the gas pedal is still on the right, and the
16 brake pedal is still on the left.

17 Q. Fair enough.

18 You have never seen any methodology that Agent
19 Raschke used used outside of the law enforcement community,
20 have you?

21 A. That's correct, I have not.

22 Q. All right. But THE fact of the matter is, sir, that you
23 don't have to use this methodology, do you?

24 A. No, I don't, and neither does law enforcement.

25 Q. Well, you're not in the business of finding people, are

1 you? People that are kidnapped.

2 A. No, I'm not in the business of finding people that are
3 kidnapped, that's correct.

4 Q. You don't use these call detail records every day to
5 actually locate where individuals are located, do you?

6 A. That is correct.

7 Q. You don't use them to locate where fugitives may be
8 hiding.

9 A. That is correct.

10 Q. And in fact what you -- now you work now for Cherry
11 Biometrics. Am I getting that right?

12 A. That's correct.

13 Q. And basically what that is is basically a one-stop shop for
14 criminal defense attorneys who need an expert, isn't it?

15 A. We testify in various areas, that is correct.

16 Q. Fingerprints?

17 A. Fingerprints.

18 Q. You're an expert in fingerprints?

19 A. I have testified in the area of fingerprints, yes, I have.

20 Q. Photographic evidence?

21 A. Yes.

22 Q. Your firm also does that as well.

23 A. That is correct, yes.

24 Q. Cell site technology. You do that as well?

25 A. That's correct.

1 Q. In-court identifications, you do that as well?

2 A. I'm not quite sure what you are referring to.

3 Q. I'll withdraw that one.

4 A. Okay.

5 Q. So you are basically willing to be an expert for what a
6 criminal defense attorney is willing to pay, right?

7 A. I am being compensated for my time and for my services,
8 yes.

9 Q. You have never worked for any of the major cellular phone
10 providers, like Sprint, Nextel, AT&T, Verizon, have you?

11 A. I have not.

12 Q. Have you ever had any conversations with their network
13 operators?

14 A. I have not.

15 Q. You don't have any regular conversations with any network
16 operators, do you?

17 A. I'm -- I'm not aware what the different -- what the
18 different members of the I triple E are employed at, but I
19 certainly keep up with the literature.

20 Q. And you commonly refer to the government's methodology as
21 junk science, isn't that right?

22 A. That is correct, yes.

23 Q. And you do that so that people can hire you to come and
24 testify in hearings like this, isn't that right?

25 A. That is correct, yes.

1 Q. You have never used call detail records to establish -- to
2 find anyone, is that correct?

3 A. That is correct.

4 Q. And you don't have any basis to disagree with the FBI's
5 assertion that they have used these records to find people on
6 numerous occasions, do you?

7 A. If they in fact use them, then they are better trackers and
8 locators than I am. I need three points of -- three
9 independent points of reference utilized simultaneously in
10 order to track the position to locate anybody. It is only the
11 FBI that says a single source of information is adequate for
12 their particular tasks.

13 Q. Well, and you have never worked in the law enforcement, is
14 that correct?

15 A. That's correct.

16 Q. And you have never had to use these records in a tracking
17 sense, have you?

18 A. Well, I have used them in courtroom testimony, in a
19 practical sense, yes.

20 Q. Well, outside of courtroom testimony, have you ever used
21 them in any practical sense outside of courtroom testimony?

22 A. I have never found a kidnap victim. I have never found a
23 dead person with them. I have never found a fugitive with
24 them. That's not my job, that's the FBI's job.

25 Q. And in fact I think what you referred to in your disclosure

1 was it was this methodology is impossible, it was impossible
2 for the FBI to use this methodology accurately.

3 A. What it is that they are doing is not scientific, that is
4 correct, yes.

5 Q. Well, but they are finding people using these techniques,
6 isn't that right?

7 A. According to Agent Raschke's testimony, yes, but -- and I
8 have no way of challenging his testimony.

9 Q. And who is it that believes these techniques aren't
10 scientific?

11 A. The entire scientific community, all of the I triple E,
12 400,000 engineers --

13 Q. Well, who is the entire scientific community, sir?

14 A. All of the people that in fact have indicated that in fact
15 single source call detail records in fact are bogus, including,
16 including NIST, which is the National Institute for Science and
17 Technology.

18 Q. Well, but you have had no conversations with any network
19 engineers as far as you are aware that have said this is bogus
20 methodology.

21 A. I have not spoken with any particular network engineer that
22 I am aware of that's a network engineer that has indicated that
23 statement, that is correct.

24 MR. YONAN: Your Honor, if I could have a moment.

25 THE COURT: All right.

1 (Brief interruption.)

2 MR. YONAN: I have no further questions, Judge. Thank
3 you.

4 THE COURT: All right.

5 REDIRECT EXAMINATION

6 BY MR. RUFO:

7 Q. Mr. Schenk, let me clarify something that I think got
8 muddled during cross examination regarding the timing of the
9 creation of the call detail record. Now am I correct that at
10 any given moment a cell phone is connecting with multiple
11 towers?

12 A. A cell phone is communicating the radiating -- radiating
13 out information, its identification information, on a periodic
14 basis. And there is multiple numbers of towers that are --
15 intercept that signal and receive that signal.

16 Q. Does that mean it is communicating with the network and the
17 MSC through multiple avenues?

18 A. That is correct, yes.

19 Q. And when I press send on my cell phone, I'm routed to the
20 MSC, and am I then assigned to a tower?

21 A. Subsequent to verification that all of your accounting
22 records in fact are accurate and all of that, yes.

23 Q. Now is that tower then recorded?

24 A. Yes.

25 Q. And that is the tower that the phone is assigned to after

1 it has communicated with the MSC?

2 A. That is correct.

3 Q. You would disagree with Agent Raschke when he says that
4 cell phones are connected to a tower, that's recorded, and then
5 the cell phone is connected to the MSC for assignment.

6 A. Well, you don't even know that that cell phone is permitted
7 to make that call at that particular instant. And if it is not
8 permitted in order to make that call, then what do you do with
9 that record? I mean, do you keep it or do you throw it away or
10 what -- what is it -- what is it that you do with that,
11 whatever else? It is irrelevant.

12 The -- the mobile switching center in fact has to
13 certify that you are permitted to make that call and make that
14 connection, at which point it records the tower that in fact it
15 will use and assign.

16 Q. So is it fair to say that you disagree with Agent
17 Raschke --

18 A. Yes.

19 Q. -- on that point?

20 What is the purpose of a call detail record?

21 A. A call detail record is an accounting record where the cell
22 phone company can certify that you made a -- that you made a
23 call at a particular point in time to a particular telephone
24 number, and so, therefore, it can be utilized in a billing
25 dispute or something of that particular nature.

1 Q. Have you ever seen any testimony or read anything that says
2 a call detail record is made so that it can be used by law
3 enforcement to locate a cell phone?

4 A. I have not read that statement, no.

5 Q. Well, I think you testified on direct examination that cell
6 phones emit a frequency 360 degrees.

7 A. That is correct.

8 Q. And they are searching for an acceptable signal.

9 A. The cell phone is not searching for anything. The cell
10 phone is simply radiating out, letting the cell towers know
11 that it exists.

12 Q. And am I correct that multiple towers have acceptable
13 signals that a cell phone can use at any given point?

14 A. Yes. Yes, certainly. And those multiple towers would then
15 report back to the mobile switching center that this particular
16 cell phone, with this identification, can be reached at this
17 particular tower. And it can obviously have multiple towers
18 that those connections can in fact be made to use.

19 So, for instance, if you are trying to reach me and
20 my cell phone is registered with the mobile switching center
21 saying I could be reached from five different towers, the
22 switching center would in fact have that information. And it
23 then would choose which particular tower it is going to utilize
24 in order to complete that call.

25 Q. Would it always use the strongest signal?

1 A. It does not have to. If the strongest signal tower
2 is -- is beyond normal capacity or it is busier than some of
3 the other ones or whatever else, it would in fact use an
4 acceptable signal on one of the other towers.

5 Q. Would it always use the closest tower?

6 A. No.

7 Q. For the same reasons?

8 A. Yes, of course.

9 Q. Does a cell phone know where it is at any given point?

10 A. A cell phone does not know anything.

11 Q. Now Mr. Yonan asked you some questions about the timing of
12 your work, and that you worked with IT&T and Western Union some
13 time ago.

14 A. That's correct.

15 Q. Have you kept up with developments in cell phone networks
16 since then?

17 A. I have tried to, yes.

18 Q. How have you done that?

19 A. As I indicated earlier, mainly through journals and through
20 internet research and articles.

21 Q. Is that also through your work with the IEEE?

22 A. Yes.

23 Q. Just a quick point I want to make about this chart. One
24 hundred twenty degrees, that is a much larger range than this.

25 A. That looks more like a 60 degree angle or whatever else.

1 Q. Greater than a right angle.

2 A. Yes, indeed it is.

3 Q. Can you take a look at -- do you still have the
4 government's binder in front of you?

5 Can you take a look at Government Exhibit Summary 6?

6 A. I'm there.

7 Q. If we were to expand the range of Agent Raschke's
8 estimations of these cell towers to a larger area, would the
9 overlap area expand?

10 A. Yes.

11 Q. Would it expand to a point off this map --

12 A. Yes.

13 Q. -- off the north end of this map?

14 A. Yes.

15 Q. Would it go straight up Western Avenue there?

16 A. Yes.

17 Q. And you were also questioned about your expert disclosure
18 letter and regarding it being impossible to utilize the
19 government's method.

20 Is it true that what you actually said is it is
21 impossible to pinpoint the location of the origin of the
22 wireless communication from a single call detail record to any
23 range smaller than approximately 1256 square miles or
24 approximately 418 square miles if the antenna used is known?

25 A. That's correct.

1 MR. RUFO: I have nothing further.

2 RECROSS EXAMINATION

3 BY MR. YONAN:

4 Q. And that is based on the fact that a tower -- that a phone
5 could hit a tower anywhere between here and 20 miles?

6 A. That is correct.

7 Q. Even though you heard Agent Raschke's testimony that he has
8 never seen a phone -- that he looked at these call detail
9 records, and he has never seen a phone use a tower 20 miles
10 away.

11 A. Well, his experience is his experience. We're talking
12 about physics, and we're talking about the science.

13 Q. So you're talking about theory, and he is talking about
14 practice, isn't that right, sir?

15 A. That's exactly correct.

16 Q. Fair enough.

17 What -- you testified a little bit about CDRs. What
18 makes you qualified to tell this Court what the purpose of a
19 CDR is?

20 A. The CDR is a -- it is an accounting billing record backup,
21 that is what it is.

22 Q. Well, but what makes you qualified to testify to that,
23 sir? What is and is not on a CDR? You don't work for a cell
24 phone company, do you?

25 A. But I can certainly read what is -- the headings that are

1 on the CDR, yes.

2 Q. You can read the headings, you can interpret the
3 information. What makes you qualified to testify about what
4 the purpose of that CDR is?

5 A. I have heard other testimony in other cases in other courts
6 that have indicated that the call detail record is in fact a
7 billing record, yes.

8 Q. Other people have told you that.

9 And what about the information that's on the CDR?

10 MR. BLEGEN: Objection, that mischaracterizes what he
11 just said. He said he heard testimony to that effect.

12 THE COURT: Correct.

13 BY MR. YONAN:

14 Q. Well, here's the thing, sir, you testified on cross that
15 the phone hits a tower and it is reflected on the CDR. And
16 then you testified on redirect that it hits the switching
17 station, is sent to another tower, and then it is --

18 MR. BLEGEN: Objection, Judge, that's
19 mischaracterizing his testimony. He didn't say that.

20 THE COURT: Well, finish the question, and then we'll
21 see.

22 BY MR. YONAN:

23 Q. The fact of the matter is you don't know when it hits a
24 CDR, do you, sir?

25 A. Yes, I do. The call detail record is generated at the time

1 that the mobile switching center assigns the tower and assigns
2 the channels that ought to be used on that particular -- on
3 that tower in order to -- in order to complete that call.

4 Q. How do you know that?

5 A. That's -- that is what in fact -- that is in fact my
6 experience and --

7 Q. What experience?

8 A. As I said, I have heard testimony to the effect -- to that
9 particular effect.

10 Q. You have not done any peer review on that, sir, have you?

11 A. No, I haven't done any peer review on that, no.

12 Q. That is not commonly accepted in the scientific community
13 as far as you know.

14 A. I don't think the scientific community is concerned about
15 CDR records.

16 Q. The fact of the matter is, sir, you don't know when a CDR
17 is generated, do you?

18 A. I am not privy to the algorithms that are utilized by the
19 various cell phone providers in regards to -- that's correct,
20 yes.

21 Q. You don't know if it is prior to -- well, and let me just
22 back up. You said the switch -- to connect to a switch, the
23 phone has to connect to a tower first, isn't that right?

24 A. That's right.

25 Q. And you don't know if the CDR is generated at that point or

1 after the switch is made to another tower.

2 A. As I indicated, if the phone is, is not permitted to make
3 that particular call because of the accounting information that
4 the mobile switching center in fact has access to, then there
5 would be no record generated, would there?

6 Q. If it never hit a tower, there would be no record
7 generated, right?

8 A. That certainly is correct, yes.

9 Q. But it has to hit a tower to actually hit the switching
10 station, doesn't it?

11 A. All cell phones are going to hit a tower in order to
12 announce their presence, yes.

13 Q. So it has to hit a tower before it can be switched to
14 another tower, doesn't it?

15 A. It doesn't necessarily have to be switched to another
16 tower, it can use that particular tower.

17 Q. Absolutely. But if it is switched, it would have to hit to
18 a tower first.

19 A. It is always hitting a tower.

20 MR. YONAN: Nothing further, Judge. Thank you.

21 THE COURT: Anything further?

22 MR. RUFO: Nothing further.

23 THE COURT: All right then.

24 Thank you.

25 THE WITNESS: You're welcome.

1 THE COURT: Are you excused.

2 (Witness excused.)

3 THE COURT: I have a question. I'd like to get the
4 agent's response to one thing that's been said here, I need a
5 little more help on.

6 MR. YONAN: Would you like him to take the stand
7 again?

8 THE COURT: Yes.

9 (Witness previously sworn.)

10 JOSEPH RASCHKE, GOVERNMENT'S WITNESS, DULY SWORN

11 THE COURT: Let's see if I can make this clear
12 enough. On Summary Exhibit 6 or Summary 6 you have a radius
13 where you show the overlap. And the defense -- I'm sorry I'm
14 not good at remembering names, but the defense expert is saying
15 that that's an arbitrary radius that you put in there, and that
16 is it should be expanding out to some distance up to 20 miles,
17 as he says.

18 So how did you determine that that's where you would
19 put the perimeter of that radius?

20 THE WITNESS: Sure. I think that the best way to
21 explain is the differences between the theoretical and the
22 actual. We're talking about a cell phone using these two
23 towers. And so that cell phone hitting off of those two towers
24 with that frequency that indicates that it is going to be in
25 that overlap area, if that overlap area -- if those continued,

1 you know, further up or towards other towers, that doesn't --
2 you know, the cell phone is still trying to decide which is the
3 best signal. The signal is getting worse as it goes farther.
4 So as it is there in that overlap area, that's where it is
5 getting, you know, the best signal from both of them.

6 And the defense expert said that as the signal goes
7 further, it degrades and becomes unusable. But it is -- it is
8 the difference between the theoretical RF propagation to this
9 20-mile number that we have set on, and the actual activity of
10 how a cell phone interacts with networks, you know, when they
11 are somewhat functioning and communicating with towers.

12 THE COURT: Okay. But could it have been a half inch
13 larger on your map or is it bound by these other towers or --

14 THE WITNESS: It is an approximated coverage area. So
15 could it be a little bit bigger, a little bit smaller? It
16 could be. It is an approximation.

17 THE COURT: Okay.

18 Any follow up with that?

19 MR. BLEGEN: Judge, I just have a couple questions
20 based on that.

21 FURTHER RECROSS EXAMINATION

22 BY MR. BLEGEN:

23 Q. I thought what you told me was that it was based on your
24 training and experience how you picked that line.

25 A. That's correct, that's my training and experience, and

1 that's an approximated area for the -- the coverage of that
2 tower and sector, you know, where the phone is going to make
3 that selection to that tower.

4 Q. But you agree that that tower -- that tower's signal
5 extends far beyond where you draw your outer line, correct?

6 The tower on the right.

7 A. The signal expands -- I don't know how far out that goes.

8 What I am saying is that that's my approximated area of where a
9 phone will select that tower for use for a phone call.

10 Q. And you're saying then instead of selecting a different
11 tower.

12 A. Correct.

13 Q. All right. But you're leaving aside, in this calculation,
14 the cell phone company's decision as to where to place a call
15 based on traffic, right?

16 A. That's correct.

17 Q. That doesn't enter into your estimation whatsoever, does
18 it?

19 A. The -- my estimation is that is where the phone is going to
20 receive, in that shaded area, the best signal from each sector
21 and from that tower. And my -- and, you know, my testimony is
22 that the phone will make those calls attempting to use the best
23 signal.

24 Q. Can I get a yes or no answer to this question? If I can't,
25 tell me so.

1 You were leaving aside in your estimation the issue
2 of or the factor of the cell company routing calls depending on
3 cell phone traffic, correct? You're not taking that into
4 account, correct?

5 A. Correct, I am indicating --

6 Q. I'm sorry, did I hear a correct, and then --

7 A. That's correct.

8 Q. -- we can all go home soon.

9 A. Well, I'd like to finish my answer.

10 Q. All right. Go ahead.

11 A. That's correct. What I am indicating in those areas is
12 those are the areas where the phone is going to select to use
13 that tower.

14 Q. I know. You have said that. But you're leaving aside in
15 your estimation the cell phone company's decision as to what
16 tower to use based on cell phone traffic, correct?

17 A. That's correct. I am not --

18 Q. And that's because you don't know the program or algorithm
19 that the cell phone company uses, correct?

20 A. I do not argue with that.

21 MR. BLEGEN: Very good. Thank you.

22 THE COURT: All right. I have one more.

23 Oh, go ahead.

24 MR. YONAN: Would you like me to go first, Judge?

25 THE COURT: Yes.

1 FURTHER REDIRECT EXAMINATION

2 BY MR. YONAN:

3 Q. Summary Exhibit 9, sir, shows that that -- those two towers
4 were used for 74 percent of the originating calls and maybe 1
5 percent of the terminating calls, is that right?

6 A. Correct.

7 Q. Does that indicate -- and that is over a course of 24
8 hours, is that correct?

9 A. I think it is 36 hours.

10 MR. YONAN: I have nothing else, Judge. Thank you.

11 THE COURT: Now this is the calls that came from a
12 single phone.

13 THE WITNESS: Correct.

14 THE COURT: Okay.

15 FURTHER RECROSS EXAMINATION

16 BY MR. BLEGEN:

17 Q. But based on the cell company's decision regarding traffic,
18 it could have come -- it could have used one of the upper
19 towers, correct?20 You have the thing in front of you? Because it is
21 hard to stay --

22 A. I don't have it in front of me.

23 Q. Take a look at Summary 6.

24 Let me know when you're there.

25 A. Okay.

1 Q. All right. So you see the -- I think there is three or
2 four other triangles, which I assume represent cell towers,
3 correct?

4 A. Correct.

5 Q. Not within that red radius?

6 A. Correct.

7 Q. Okay. So the cell phone could have been closer to one of
8 those towers, even closer to the north or west, but the cell
9 company directed it to the towers in question based on traffic,
10 correct?

11 A. I'm not saying that. What I am saying is that I -- it is
12 my position that the cell phone is contacting that tower, and
13 that's when the call detail records are populated. Your
14 witness doesn't agree with me.

15 Q. Okay.

16 A. So what I am saying is that in that approximated coverage
17 area, that's when -- when that tower is contacted by that
18 phone. Now after that contact is made, I don't know what the
19 network did with it after that. You're right, I don't have
20 access to that algorithm.

21 But what I am saying is for it to be connected to
22 that tower, it has to be in the coverage area of that tower,
23 and that's my estimation of where that coverage area is.

24 Q. And just so we're clear, and you acknowledge there is a
25 difference between you and our expert -- our witness regarding

1 whether the cell company, through its computer, routes you to a
2 tower first, which is what our expert says, and your testimony
3 is that, no, you go to a tower and you record -- and that's
4 recorded on your billing statement first, and then you get
5 rerouted to another tower, potentially, by the computer.

6 A. It's not on your billing statement, it is on the call
7 detail records.

8 Q. I'm sorry?

9 A. My position is that the call -- the call detail records
10 with cell site are populated when the phone requests resources
11 from that tower.

12 Q. And you acknowledge that that's different from what our
13 witness is saying, which is one of the multiple towers that it
14 is in communication with, the phone, is also in communication
15 with the computer, which at the time a call is made, picks the
16 tower. You acknowledge that distinction in your testimony from
17 his, right?

18 A. We -- our distinction is when that call was made. I
19 believe that your witness's opinion is not correct.

20 Q. I know. I just want to make sure we -- there was a little
21 confusion about whether there was a disagreement or not. You
22 have a disagreement with him about that, correct?

23 A. I do.

24 Q. Okay. Thank you.

25 MR. BLEGEN: Nothing further. Sorry.

1 MR. YONAN: Just one question.

2 FURTHER REDIRECT EXAMINATION

3 BY MR. YONAN:

4 Q. Under the defense expert's theory, the cell phone would
5 have no way of knowing whether that tower is too busy because
6 it is not recorded on the call detail records, it is just they
7 shipped it off to another tower, wouldn't that be right?

8 A. Well, you wouldn't know what the usage is on that tower
9 and --

10 Q. Because no record would be generated.

11 A. There wouldn't be -- there is not a record generated, so --
12 I mean, we're talking about the -- when the phone requests
13 resources from the tower, there is your record.

14 FURTHER RECROSS EXAMINATION

15 BY MR. BLEGEN:

16 Q. Is it your testimony that a cell phone company only keeps
17 historical records of how busy their towers are? They don't
18 know it in current time?

19 A. I have no idea what they do in current time.

20 Q. Well, you know in order to route things to deal with
21 traffic, they have to do it currently, correct?

22 A. Right. I don't know what their record keeping is on that.

23 Q. All right. Forget about record keeping. Mr. Yonan just
24 said they wouldn't even know if the tower was busy unless the
25 phone tried to connect to it, right?

1 A. Right. There would be no basis to make that decision. The
2 phone had to connect to the tower, and then the network is
3 going to decide what to do. Either the call is being placed
4 through that tower or it may get moved to another tower.

5 Q. Is it your testimony that the cell company's computer does
6 not know in realtime how busy its other towers are?

7 A. As I have said, I don't know what the cell phone companies
8 maintain a record of in realtime.

9 Q. All right. So you don't know that.

10 A. Correct.

11 Q. All right.

12 THE COURT: All right. I'll ask you this thing about
13 the sequence where you say, I -- clearly you disagree. How do
14 you know what you know?

15 THE WITNESS: I actually have had conversations with
16 cell phone company representatives, network engineers. I have
17 seen this type of data in actual situations where you can be --
18 run a pen register, and you can see the cell sites that are
19 being utilized by a cell phone. And I have seen where they
20 have cell phones that are hitting two different cell sites.
21 And we have recovered phones in that overlap area, in those
22 approximated coverage areas.

23 Actually I have real life experience on it to draw on,
24 and actually have had discussions with the people who design
25 and provide maintenance to these networks about how this

1 functions.

2 That's the basis of my --

3 MR. YONAN: If I could just direct the Court's
4 attention to Summary Exhibit 2, which shows a tower -- it shows
5 two towers being used for one call.

6 THE COURT: Okay. Any further questions of this
7 witness?

8 MR. BLEGEN: No, Judge.

9 THE COURT: Thank you.

10 THE WITNESS: Thank you.

11 (Witness excused.)

12 THE COURT: All right. Do you folks want to make any
13 argument? I don't really have time to do it tonight because I
14 have to leave, but we can set another time.

15 MR. YONAN: Whenever you would like do it, Judge, is
16 fine.

17 THE COURT: Tomorrow would be best, before I forget
18 all of this.

19 THE CLERK: 10:00 o'clock.

20 THE COURT: 10:00 o'clock?

21 MR. YONAN: I am available.

22 MR. BLEGEN: Judge, I have court in the building at
23 9:30, and then 9:45 I am supposed to be far away in Kankakee
24 with an interpreter.

25 THE COURT: So that's not so good.

1 MR. BLEGEN: Yeah.

2 THE COURT: The next day?

3 MR. BLEGEN: Thursday works fine for me.

4 MR. YONAN: That will be fine also, Judge.

5 THE CLERK: 10:00 o'clock Thursday.

6 THE COURT: Thursday at 10:00. Okay.

7 MR. YONAN: Thank you, your Honor.

8 MR. BLEGEN: Thank you, Judge.

9 (Adjournment at 5:10 P.M. to reconvene at 10:00, August
10 23, 2012.)
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